Vol. 887 Number 1

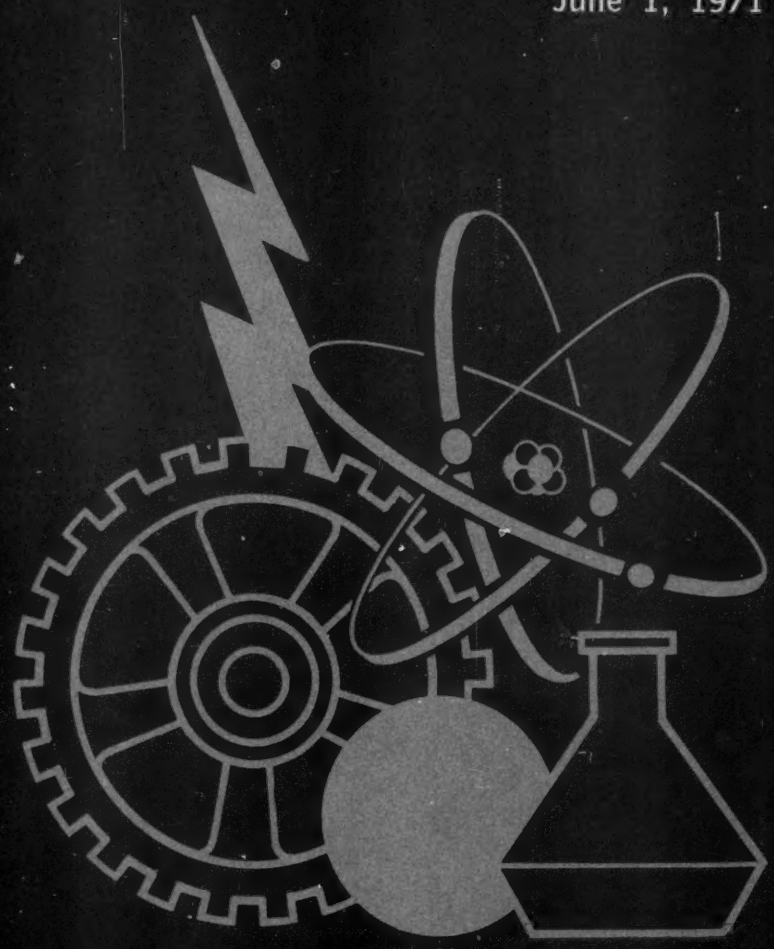
OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

June 1, 1971



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

June 1, 1971 Volume 887 Number 1

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PATENT OFFICE NOTICES

Dedication

2,790,153.—*Samuel L. Arson,* Glendale, Calif. POLARIZED ELECTRICAL PLUG AND SOCKET CONNECTOR HAVING A PLURALITY OF CONTACTS. Patent dated Apr. 23, 1957. Dedication filed Jan. 6, 1971, by the assignee, *International Telephone and Telegraph Corporation.*

Hereby dedicates the remaining term of said patent to the Public.

Disclaimer

3,567,603.—*George J. Crane,* Islington, Ontario, Canada. REDUCTION OF CORROSION IN THE ELECTROLYTE SURROUNDING A MULTIPOLAR CELL. Patent dated Mar. 2, 1971. Disclaimer filed Oct. 29, 1970, by the assignee, *Huron-Nassau Ltd.*

Hereby disclaims the terminal portion of the term of said patent subsequent to Mar. 31, 1987.

Vacancy Announcement

POSITION

Director, Office of Legislation and International Affairs GS–1220–16.

LOCATION

Arlington, Virginia.

DUTIES

Under the general administrative direction of an Assistant Commissioner of Patents, and within International guidelines provided by the State and Commerce Departments, the director; (1) heads the entire legislative and international patent and trademark programs for the United States; (2) formulates the broad objectives and the specific goals of these programs; (3) plays a significant role in the establishment and the implementation of national and international policy in the patent and trademark fields; (4) heads a staff of professionals who are involved in negotiations on technological, legal, and economic matters; (5) negotiates personally with foreign officials on international exchanges and agreements; (6) manages international study projects dealing with varying technical and legal situations; and (7) acts as an advisor to the Commissioner of Patents and other Federal officials.

QUALIFICATIONS

A minimum of five years of progressively responsible experience in the patent field showing the attainment of a position requiring a very high level of responsibility. Such experience must have demonstrated the following competence:

(1) A broad knowledge of diverse scientific and engineering fields, of domestic and foreign legal systems, of international agreements, and of world trade and patent economics;

(2) Analytical ability, general executive ability, and negotiating ability; and

(3) Ability to present, defend, and interpret the programs to top levels of authority.

EVALUATION OF CANDIDATES

Candidates will be evaluated on the total range of their education, training, and experience, as well as supervisory appraisals. An interview may be required.

GENERAL INFORMATION

Full consideration will be given to all qualified applicants without regard for their race, sex, religion, color, or national origin. Candidates who are interested in being considered for this position must submit a completed SF–171, Personal Qualifications Statement, to the U.S. Patent Office, Office of Personnel, Washington, D.C. 20231, not later than June 18, 1971. Copies of SF–171 may be obtained from any Civil Service Commission Regional Office or first class Post Office.

Questions concerning this announcement should be referred to Mr. Bradford R. Huther, Area Code 703, 557–3635, Building No. 2, Room 9–C05, Crystal Plaza, Arlington, Va.

Certificates of Correction for the Week of June 1, 1971

D. 218,904	3,543,019	3,552,636	3,559,465
3,327,584	3,544,321	3,552,852	3,559,519
3,350,417	3,544,570	3,552,863	3,560,405
3,352,499	3,544,754	3,552,990	3,560,475
3,467,263	3,545,590	3,553,114	3,560,521
3,512,069	3,545,621	3,553,481	3,560,782
3,513,823	3,545,915	3,553,659	3,561,185
3,514,453	3,546,148	3,553,761	3,561,719
3,514,487	3,547,086	3,553,773	3,561,884
3,521,020	3,547,127	3,553,811	3,562,075
3,522,180	3,547,811	3,553,903	3,562,137
3,526,167	3,547,814	3,554,000	3,562,150
3,529,215	3,548,106	3,554,145	3,562,848
3,533,938	3,548,417	3,554,217	3,563,175
3,534,062	3,548,495	3,554,639	3,563,281
3,534,772	3,548,502	3,554,696	3,563,563
3,535,027	3,549,503	3,554,928	3,563,937
3,535,205	3,549,663	3,554,988	3,564,301
3,535,425	3,550,537	3,555,865	3,565,799
3,538,876	3,551,062	3,556,411	3,565,967
3,540,808	3,551,148	3,556,468	3,567,337
3,541,114	3,551,420	3,556,983	3,567,567
3,541,746	3,551,423	3,557,312	3,567,702
3,542,178	3,551,506	3,557,699	3,570,318
3,542,545	3,551,812	3,557,863	
3,542,803	3,552,024	3,558,278	
3,542,885	3,552,265	3,558,574	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 18, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-02-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-01-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-17-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-03-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-02-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	9-01-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-07-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-19-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-02-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-23-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-17-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	4-01-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	2-02-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-02-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	6-23-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	2-02-70

Expiration of patents: The patents within the range of numbers indicated below expire during May 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,677,129 to 2,679,644, inclusive
Plant Patents ..... Numbers 1,274 to 1,281, inclusive

DEFENSIVE PUBLICATIONS

JUNE 1, 1971

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

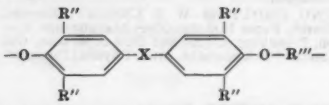
Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T887,001
COMPOSITE ASSEMBLIES INCORPORATING THREE-DIMENSIONAL POLYMERS

Winston J. Jackson, Jr., and John R. Caldwell, both of P.O. Box 511, Kingsport, Tenn. 37901

Continuation of application Ser. No. 562,507, July 5, 1966. This application Dec. 18, 1969, Ser. No. 882,763
Int. Cl. B32b *27/06, 27/34*
U.S. Cl. 161—183
No Drawing. 22 Pages Specification

Composite assemblies comprising at least two structural members bonded together by an adhesive member composed essentially of a polymer of a bifunctional carboxylic acid and a bisphenol, said bisphenol having the following general formula:



wherein each R'' is a substituent selected from the group consisting of a hydrogen atom, a halogen atom, and an alkyl radical containing from 1 to 4 carbon atoms, R''' is the residue of a bifunctional carboxylic acid precursor having up to 40 carbon atoms and is selected from the group of precursors consisting of carbonic acid and dicarboxylic acids, and X is a gem-bivalent radical having a saturated polycyclic three-dimensional structure which includes a saturated bicyclic atomic bridged hydrocarbon ring member.

T887,002
REMOVAL OF ANTIOXIDANT FROM STYRENE-BUTADIENE COPOLYMER FILM WITH REDUCING FLAME

Leon Edward Wolinski, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1969, Ser. No. 887,304
Int. Cl. B29c *25/00*
U.S. Cl. 264—80
No Drawing. 3 Pages Specification

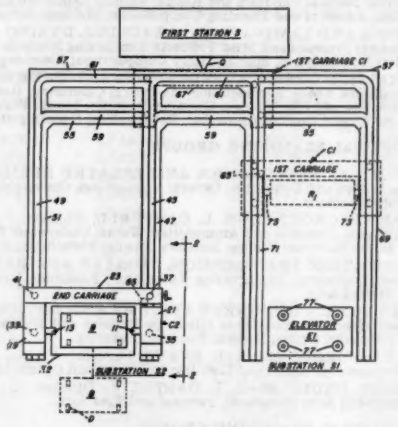
Process for the removal of antioxidant from the surface of styrene-butadiene copolymer film by exposing the surface, for a period of about from 0.01 to 0.05 seconds, to a reducing flame of a gaseous mixture consisting essentially of hydrocarbon fuel, oxygen and nitrogen. The reducing flame should have an oxygen ratio of about 2.78 and a fuel equivalence ratio of about from 1.05 to 1.25.

T887,003
ROLL DEBOXING AND TRANSPORTING APPARATUS

Clifford B. Bushnell, 1669 Lake Ave., Rochester, N.Y. 14650

Filed Feb. 16, 1970, Ser. No. 11,566
Int. Cl. B65g *47/00*
U.S. Cl. 214—622
1 Sheet Drawing. 9 Pages Specification

Apparatus for conveying rolls of photographic film or paper between a first station (such as a slitter S) and a second station (such as a storage area) comprises two identical loading or unloading substations S1 and S2, and separate carriages C1 and C2 having ball casters running in grooved tracks for engaging rolls R1 and R2 and carrying them to slitter S. The tracks comprise a single pair **55**, **57** adjacent to and centered on the slitter, and extending laterally in opposite directions therefrom; and two other pairs **47**, **51** and **69**, **71** extending to substations S1 and S2 at right angles from, and connecting smoothly to, opposite ends of tracks **55**, **57**. Carriage C2 is U-shaped and encloses a hydraulic elevator E2 on three sides, upon



which a dolly carrying a boxed roll is run and is then lifted up so that gudgeons **11**, **13** engage the ends of the roll. Gudgeons **11** and **13** are movable toward and away from one another. Levelling jacks **31** on elevator E2 provide fine positioning of the box B and the roll R2. Then the elevator is lowered so that box B and dolly D can be rolled off the elevator. Each carriage is provided with a downwardly extending guide wheel which engages a cam surface **67** adjacent slitter S to keep the carriage rolling in a straight line.

T887,004
METHOD OF MAKING STABILIZED SILVER HALIDE EMULSIONS SENSITIVE TO LIGHT

Albert T. Brault, Kodak Park Works, Rochester, N.Y. 14650

Filed Mar. 16, 1970, Ser. No. 20,118
Int. Cl. G03c *1/02, 5/04, 5/24*
U.S. Cl. 96—27
No Drawing. 17 Pages Specification

Organic onium halides are used to stabilize a silver halide photographic emulsion by forming a stable complex with the silver halide and the emulsion is resensitized by treatment, e.g. at room temperature, with a nucleophile such as water, ammonium hydroxide or pyridine. Thus, stable photographic emulsions can be prepared in the light and rendered light-sensitive just prior to exposure. Also

new images can be added to previous images in a convenient "add-on" system. Examples of suitable organic onium halides include tetramethylammonium bromide, tetraethylammonium bromide, butyltriphenylphosphonium bromide, and dodecyldimethylsulfonium iodide. The tetraalkylammonium halides also can increase the stabilization rate of sodium thiosulfate with less staining than occurs when ammonium halides are added to thiosulfate baths. Similarly, tetraalkylammonium thiosulfates are superior to ammonium thiosulfate as stabilizers. Also disclosed is a salt coagulation technique for fine grain emulsions in which the emulsion is warmed to 50–60° C., Na_2SO_4 is added, pH is adjusted to below 3, and the emulsion is rapidly cooled to 5° C. to obtain a firm coagulum.

T887,005

CONTROL OF MOLECULAR WEIGHT OF POLY (ETHYLENE TEREPHTHALATE) DURING SOLID PHASE POLYCONDENSATION

Charles J. Kibler, 620 Dogwood Drive 37663; David L. Nealy, 908 Afton St. 37660; and Thomas G. Davis, 1368 Garden Drive, 37664, all of Kingsport, Tenn.

Filed Apr. 2, 1970, Ser. No. 25,270
Int. Cl. C08g *17/03*
U.S. Cl. 260—75
No Drawing. 15 Pages Specification

Process of manufacturing a polyester by initially forming a molten prepolymer from a glycol, such as ethylene glycol and a difunctional compound such as terephthalic acid or a lower dialkyl diester thereof, solidifying the resulting prepolymer, crystallizing the prepolymer, pulverizing the crystallized prepolymer, polymerizing the pulverized prepolymer in a heated fluidized bed in the presence of a continuously introduced stream of preheated inert gas, wherein an improvement resides in maintaining within the fluidized bed a controlled concentration of glycol vapor, whereby the molecular weight of the polymer is caused to attain a predetermined value.

T887,006

KETOVINYL COMPOUNDS AND PHOTOGRAPHIC HARDENERS

Donald M. Burness and Robert A. Silverman, both of Kodak Park Works, Rochester, N.Y. 14650

Filed Apr. 23, 1970, Ser. No. 31,350
Int. Cl. C07c *53/16*; G03c *1/30*
U.S. Cl. 96—111
No Drawing. 21 Pages Specification

Compounds having the structure:

$$RCH{=}CHCO(ZCO)_mCH{=}CHR$$

wherein Z is a covalent bond or a divalent hydrocarbon radical such as an alkylene radical, a cycloalkylene radical or an arylene radical; m=0 to 1 and R is selected from alkoxy, halo, arylthio, secondary and tertiary amino groups and $-B^+X^-$ wherein B^+ is selected from an ammonium salt residue such as trialkylammonium, dialkylhydrazinium or a heterocyclic ammonium salt residue having 5–6 atoms in the heterocyclic ring, either unsubstituted or substituted and X^- is an acid anion, such as chloride, bromide, fluoride, iodide, perchlorate, methanesulfonate, benzenesulfonate, toluenesulfonate or fluoroborate, have been found to exhibit strong activity as gelatin hardeners. Compositions comprising gelatin and the hardener compounds and gelatin-silver halide photographic emulsions containing the hardener compounds are disclosed. 3,8-dioxo-1,9-decadiene-1,10-bis(pyridinium chloride); 1,10 - dichloro-1,9-decadiene-3,8-dione; 1,10 - dipiperidino-1,9-decadiene-3,8 - dione; 3,8-dioxo-1,9-decadiene-1,10-bis(trimethylammonium perchlorate) and 3-oxo-1,4-pentadiene-1,5-bis (pyridinium chloride) are representative hardener compounds.

T887,007

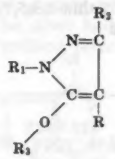
5-PYRAZOLONE ENOL ESTERS COUPLER PRECURSORS IN FOREHARDENED INCORPORATED-COUPLER COLOR PHOTOGRAPHIC MATERIALS AND METHOD TO CONVERT SAME TO FREE 5-PYRAZOLONE

Dale S. Dallon, Kent R. Rush, Ilmari F. Salminen, and Paul S. Von Bacho, all of Kodak Park, Rochester, N.Y. 14650

Filed Apr. 27, 1970, Ser. No. 32,428
Int. Cl. G03c *1/40*
U.S. Cl. 96—100
No Drawing. 29 Pages Specification

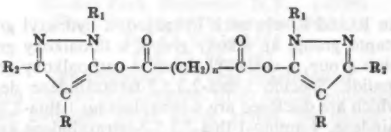
5-pyrazolone color couplers are incorporated in aldehyde forehardened color photographic emulsions as enol esters of carboxylic and sulfonic acids to prevent reaction of 5-pyrazolone with aldehyde forehardening agent. A method is also provided for the conversion of the enol ester to the free 5-pyrazolone in order that it can couple with oxidized color developer which comprises treating the 5-pyrazolone enol ester with an alkaline solution containing at least one organic amine prior to or concurrent with color development. Enol esters useful within the scope of this invention are illustrated by the general formulae:

(I)



and

(II)



wherein R represents hydrogen, alkyl, thiocyano, acyloxy, heterocycloxy, aryloxy, alkoxy, sulfo, arylazo, aminoarylazoxy, aryltriazolyl, alkylmonothio, arylmonothio and heterocyclicmonothio; R_1 represents hydrogen, alkyl, aryl and heterocyclic; R_2 represents hydrogen, alkyl, aryl, heterocyclic, amino, carbonamido, sulfonamido, alkylsulfamyl and alkylcarbamyl; R_3 represents carboxylic and sulfonic acid radicals and n represents a positive integer of from 1 to 8. Amines suitable for treating the enol esters include hydrazine, 1,1-dimethylhydrazine, phenylhydrazine, pyridine, imidazole, ethylenediamine, trimethylamine, triethylamine, 2-aminoethanol and quinuclidine.

T887,008

METHOD OF MAKING A SILVER HALIDE SENSITIZED DIRECT-POSITIVE LITHOGRAPHIC PRINTING PLATE

Edward C. Yackel, Pittsford, N.Y.
(Kodak Park Works, Rochester, N.Y. 14650)

Filed June 19, 1970, Ser. No. 47,892
Int. Cl. G03f *7/02*
U.S. Cl. 96—33
No Drawing. 7 Pages Specification

The method for preparing a photolithographic printing plate consists of the following steps: (a) a reducible salt such as a silver salt from which physical development nuclei will be prepared is added to a cellulose ester solution and this solution is then coated on a suitable support such as polyethylene terephthalate to form a hydrophobic layer and (b) the layer of (a) is treated with a hydrolyzing solution containing a reducing agent in which the hydrolyzing solution renders the hydrolyzed layer hydrophilic and the reducing agent also reduces the reducible salt to metallic nuclei and (c) the forming of a positive

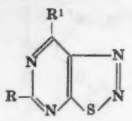
image in the above layer by coating, exposing and developing of a silver halide negative emulsion on the hydrolyzed layer with a processing solution containing a silver halide solvent to form an image by diffusion transfer and subsequent removal of the emulsion or by a diffusion transfer process in which the emulsion is coated on a separate sheet, exposed, developed and transferred to the hydrolyzed layer by steps (a) (b) above and treatment with an organic thiol to render the positive image hydrophobic and, therefore, ink receptive. If desired, the image may be rehalogenized before treating with the thiol.

T887,009
FOG STABILIZERS FOR PHOTOGRAPHIC EMULSIONS

Dorothy Johnson Beavers and Norman Wayne Kalenda, both of Kodak Park Division, Rochester, N.Y. 14650

Filed June 22, 1970, Ser. No. 48,553
Int. Cl. G03c *1/34*
U.S. Cl. 96—109
No Drawing. 12 Pages Specification

There are disclosed photographic silver halide emulsions and photographic elements containing a fog stabilizing amount of a 1-thia-2,3,5,7-tetrazaindene derivative having the formula



wherein R and R^1 are each hydrogen, a hydroxyl group, a mercapto group, an alkoxy group, a thioalkoxy group, an amino group, a carboxyl group, a carboalkoxy group, or a halide. Specific 1-thia-2,3,5,7-tetrazaindene derivatives which are disclosed are 4-benzylamino-1-thia-2,3,5,7-tetrazaindene, 4-amino-1-thia-2,3,5,7-tetrazaindene and 4-chloro-1-thia-2,3,5,7-tetrazaindene. These compounds, incorporated in a fog stabilizing concentration into photographic layers such as an emulsion coated onto a support, provide significant decreases in incubation fog.

Silver halide emulsions and elements stabilized as described can be chemically sensitized, e.g. with noble metal sensitizers alone or in combination with sulfur or selenium sensitizers. They can contain spectral sensitizers, incorporated color forming couplers, incorporated developing agents, other antifoggants, hardeners, plasticizers, coating aids, and other suitable photographic addenda such as described in U.S. Pat. 3,297,446 issued to Dunn on Jan. 10, 1967.

T887,010
INHIBITING POLYMERIZATION OF VINYL MONOMERS

Arthur P. Werts III, 1362 Lafayette Circle, Kingsport, Tenn. 37664

Filed July 2, 1970, Ser. No. 52,080
Int. Cl. B01j *1/16*; C07c *17/42*
U.S. Cl. 252—404
No Drawing. 10 Pages Specification

Undesired polymerization of vinyl monomers, either in storage or while undergoing purification by distillation of the monomeric material (as a step in the process by which the monomers are synthesized), can be prevented by adding to the liquid monomer as a polymerization inhibitor small amounts of an alkyl ether of 2,6-di-tert-butyl hydroquinone such as 2,6-di-tert-butyl-4-octyloxyphenol; 2,6-di-tert-butyl-4-methoxyphenol; 2,2'-bis(3,5-di-tert-butyl-4-hydroxyphenoxy) - p - xylene; 1,4-bis(3,5-di-tert-butyl-4-hydroxyphenoxy)butane; 2,6-di-tert-butyl-4-benzoyloxyphenol; and 1,4-bis(3,5-di-tert-butyl - 4 - hydroxyphenoxy)-p-xylene. By employing an inhibitor of this type, undesired polymerization of the monomer in storage, purification, or use is effectively prevented. This class of inhibitors contribute no undesirable color to vinyl monomers to which they are added and do not interfere in any way with subsequent processing of the stabilized monomer into any desired ultimate product.

T887,011
AMMONIA-BROMOTRIFLUOROMETHANE FIRE EXTINGUISHING COMPOSITION

Howard Elliot Phillips, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

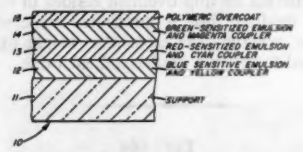
Filed July 31, 1970, Ser. No. 60,097
Int. Cl. C09k *3/28*
U.S. Cl. 252—8.1
No Drawing. 9 Pages Specification

The addition of ammonia sufficient to supply at least 4 vol. percent of ammonia to an area containing an explosive mixture of air and volatilized flammable compound reduces by at least 2 vol. percent the amount of expensive bromotrifluoromethane fire retardant that must be introduced into the area to inert the explosive mixture.

T887,012
PHOTOGRAPHIC ELEMENTS HAVING NON-GELATIN OVERCOATS

Carl W. McGraw and Philip F. Hutton, both of 1669 Lake Ave., Rochester, N.Y. 14615

Filed Nov. 13, 1970, Ser. No. 89,324
Int. Cl. G03c *1/76*
U.S. Cl. 96—67
1 Sheet Drawing. 14 Pages Specification



A photographic element such as photographic film or paper is overcoated with a layer of carboxymethylated casein or sodium ethylcellulose sulfate. Top coats of these polymers protect the photographic element against reticulation and permit rapid coating at elevated temperature during manufacture of the element and also high-temperature processing of the exposed photographic element. Especially useful embodiments comprise multilayer color film or paper having incorporated color couplers in the gelatino-silver halide emulsion layers and which are overcoated with about 40 to 90 mg./ft.^{2} of carboxymethylated casein or sodium ethylcellulose sulfate. These protective overcoats can also be employed, for example, in matrix-type film used in dye diffusion transfer processes. Such a film comprises an unhardened gelatino-silver halide emulsion coated on a transparent support such as polyethylene terephthalate. This emulsion layer is overcoated with an anti-halation layer comprising unhardened gelatin and carbon black in a concentration, for example, of one part carbon black to one part gelatin by weight. In a typical imbibition process, the matrix film is exposed through the transparent film support and processed in a tanning developer to remove untanned gelatin, including the unhardened carbon-containing gelatin layer, and the non-gelatin protective overcoat. The imagewise differentially hardened gelatin is imbibed with dyes containing mordanting groups and the dyes are then transferred to a receiving sheet, as described in Mees, "Theory of the Photographic Process," 3rd ed., the MacMillan Company, N.Y. (1966), page 395.

T887,013
DISSIPATION OF ATMOSPHERIC FOG
Richard E. Chaddock, 4826 Kennett Pike, Greenville, Del. 19807
Filed Nov. 13, 1970, Ser. No. 89,515
Int. Cl. E01h *13/00*
U.S. Cl. 239—2
No Drawing. 15 Pages Specification

Disclosed is dissipation of atmospheric fog by dispersing polyelectrolytes of a defined group into the fog mass. Utilization of a beta-methacryloyloxyethyltrimethylammonium methyl sulfate (MTMMS)—acrylamide copolymer fog dispersant is now preferred. The polyelectrolytes are water-soluble polymers from the following:

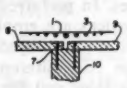
(a) vinyl homopolymers containing quaternary ammonium groups,

(b) vinyl polymers containing both quaternary ammonium groups and tertiary amine groups, the amount of quatrenary ammonium groups being greater than the amount of tertiary amine groups,

(c) copolymers of vinyl monomers containing quaternary ammonium groups and up to 99% by weight of the total of acrylamide or acrylamide substituted on the alpha carbon atom or on the nitrogen atom, or

(d) terpolymers of vinyl monomers containing quaternary ammonium groups, vinyl monomers containing tertiary amine groups, and up to 99% by weight of the total of acrylamide or acrylamide substituted on the alpha carbon atom or on the nitrogen atom, the amount of quaternary ammonium groups in the terpolymer being greater than the amount of tertiary amine groups.

T887,014
HOT MELT ADHESIVE TAPES FOR FILLING SEAMS BETWEEN ADJACENT DRY-WALL CONSTRUCTION BOARDS AND FOR OTHER PURPOSES
Howard L. Overbay and Parker J. Trent, both of P.O. Box 511, Kingsport, Tenn. 37601
Filed Nov. 16, 1970, Ser. No. 89,676
Int. Cl. B32b *1/04, 29/06, 31/20*
U.S. Cl. 161—118
2 Sheets Drawing. 14 Pages Specification



A seam sealing tape to fill voids between abutting sections or cracks in wall board or similar materials in a wall or ceiling construction, including a paper or other supporting tape coated on one surface with a hot melt adhesive which is a solid at room temperature but susceptible of melting and plastic flow by the application of heat to the uncoated surface of the tape. The adhesive is disposed on the supporting tape in one of two forms, that is, either as a continuous layer or coating or in the form of continuous beads disposed in parallel relation one to another along the length of the tape. In either form the adhesive is disposed on the tape in such manner as to provide a maximum amount of adhesive along the center line of the tape so that, when the tape is laid over a void with the adhesive side down and heat applied as with a hot iron, the void can be rapidly filled and covered in a single operation. The resulting sealed seam requires no drying step and can be completely obscured by painting or by the application of spackling compounds immediately after the sealing operation.

T887,015
DEVELOPMENT OF PHOTOGRAPHIC MATERIALS
Edward C. Yackel, Kodak Park Division, Rochester, N.Y. 14650
Filed Nov. 16, 1970, Ser. No. 90,026
Int. Cl. G03c *5/26*
U.S. Cl. 96—63
No Drawing. 12 Pages Specification

Development of a latent image in an exposed, photographic silver halide emulsion layer is provided by contact of the emulsion layer with a metal which is magnesium, cadmium, zinc or iron in the presence of water and a silver halide developing agent, while in the absence of a sequestering agent. The silver halide developing agent is incorporated in the emulsion layer or a layer contiguous to the emulsion layer.

T887,016
PHOTOGRAPHIC MATERIALS
Kirby M. Milton, Victor, N.Y. (Kodak Park, Rochester, N.Y. 14650)
Filed Nov. 16, 1970, Ser. No. 90,123
Int. Cl. G03c *1/28*
U.S. Cl. 96—107
No Drawing. 19 Pages Specification

High contrast photographic silver halide emulsions comprising unfogged silver halide grains, the halide of the silver halide being at least 50 mol percent chloride, have on the surface thereof a halogen acceptor and a sufficient quantity of iodide to effectively increase the speed of said silver halide, said quantity of iodide being in addition to any iodide present in said grains as mixed silver halide. Preferably, the iodide is added to the grains in the form of a water-soluble salt, e.g., an alkali metal or ammonium iodide. The halogen-accepting compounds have an anodic polarographic half-wave potential less than 0.85 volt and a cathodic polarographic half-wave potential more negative than —1.0 volt. Merocyanine halogen acceptors give good results. The iodide salt is preferably potassium iodide employed in the emulsion at a concentration of about .1 to 3 grams per mole of silver halide; the emulsion is preferably a fine grain emulsion having an average grain size less than about .5 micron; and, the halogen acceptor is preferably the merocyanine dye 1-carboxymethyl-5-[(3-ethyl - 2-benzoxazolinylidene)ethylidene]-3-phenyl-2-thiohydantoin, which is advantageously used at about 450 mg. per mole of silver halide.

REISSUES

JUNE 1, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,127

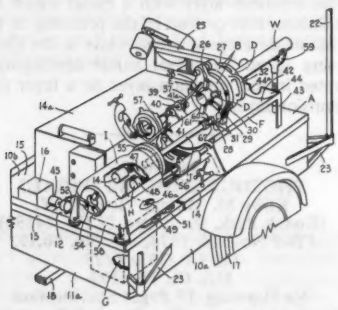
PIPE WORKING ASSEMBLY

Joe A. Ivester, 62 Rock Creek Drive, Greenville, S.C. 29605

Original No. 3,332,095, dated July 25, 1967, Ser. No. 471,245, July 12, 1965. Application for reissue July 15, 1969, Ser. No. 848,760

Int. Cl. B23g *1/00*

U.S. Cl. 10—106 **7 Claims**



A portable power tool assembly for pipe working and the like has a longitudinal driving means, in the form of a bar, drivingly engaged on one end thereof by a power driven longitudinally aligned assembly, a driving connection between the driving means and a spaced longitudinally aligned chuck assembly on the other end of the driving means, a movable housing carrying a longitudinally aligned cutting die assembly, said power driven assembly being carried on one side of the cutting die assembly and the chuck assembly being carried on the other side of the cutting die assembly, and means discharging oil upon the dies and pipe with means collecting such oil, so that a unitary power tool assembly is longitudinally driven to minimize size and enhance the range of its usefulness.

27,128

SOLID STATE POWER CIRCUITS EMPLOYING NEW AUTOIMPULSE COMMUTATION

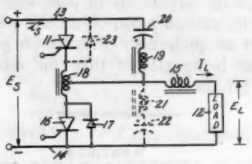
Raymond E. Morgan, deceased, late of Schenectady, N.Y., by Agnes T. Morgan, administratrix, Schenectady, and Burnice D. Bedford, Scotia, N.Y., assignors to General Electric Company

Original No. 3,376,492, dated Apr. 2, 1968, Ser. No. 354,888, Mar. 26, 1964. Application for reissue Apr. 1, 1969, Ser. No. 812,473

Int. Cl. H02m *7/48*

U.S. Cl. 321—43 **71 Claims**

This invention comprises a family of improved power circuits using a pair of turn-on, nongate turn-off controlled conducting devices interconnected in series circuit relationship with a tapped first linear inductor across a pair of power supply terminals that are adapted to be connected across a source of electric potential. A load circuit is separately connected in series circuit relationship with the first of said pair of devices with the load circuit being connected through a direct current path between the tap point on the first linear inductor and one of the power supply terminals. The circuits are further comprised by commutation circuit means formed by at least one commutating capacitance and series connected second linear inductor with the series circuit thus comprised being connected between the tap point on the first linear inductor and to the remaining terminal (not connected to the first inductor) of one of the conducting devices. The series circuit comprised by the commutating capacitor and second inductor is tuned to series resonance at a commutating frequency having a period which is substantially shorter



than the load current conducting periods of the power circuit. With this arrangement, one of the pair of controlled conducting devices is adapted to be intermittently rendered conductive for discharging the commutating capacitance through a portion of the first inductor and thereby terminating the conduction of the other of the pair of conducting devices. In preferred embodiments bidirectional conducting devices are employed, and where such bidirectional devices are employed the circuits may also provide operation in two different modes to allow for power supply to the load and for pump back of power from the load to the power source, as well as inversion from direct current to alternating current. Bridge type power circuits comprising the same basic circuit configurations are also provided.

27,129

ADJUSTABLE MANIPULATOR

Jerome H. Lemelson, Metuchen, N.J.

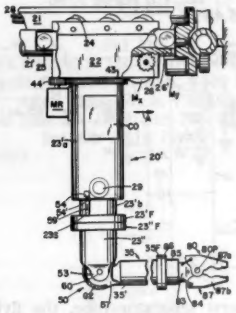
Original No. 3,260,375, dated July 12, 1966, Ser. No. 251,411, Jan. 14, 1963. Application for reissue June 9, 1969, Ser. No. 848,757

Int. Cl. B25j *3/00*

U.S. Cl. 214—1 **18 Claims**

An automatic article manipulation apparatus including a selectively positionable, track-riding carriage having a first column depending therefrom which contains a second column telescoped into such first column for longitudinal vertical movement therein. The second column has a jaw assembly hinged to its lower end for swinging movement in a vertical plane. The apparatus effects a plurality of independent motions to position the jaw assembly in a preselected position. For example: (a) the carriage effects

self-actuating, reversible travel on a conveyor track; (b) the first column is horizontally rotatable by self-actuating means on the carriage; (c) the second column is vertically displaceable by self-actuating means within the first column; (d) the jaw assembly is selectively rotatable



on the lower end of the second column; (e) the jaw assembly has selectively operative jaws for grasping articles; etc. All such motions may be independent of each other or selectively coact with each other in a preselected manner by the use of pre-positioned limit switches.

27,130

ULTRAMINIATURE TAPE RECORDER WITH TWO-WAY GRAVITY-OPERATED CONTROL SWITCH ACTUATED BY CHANGE IN VERTICAL ORIENTATION OF RECORDER

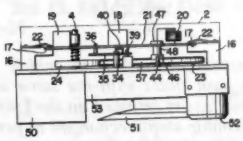
Sanjiro Murata, 10–60, 3-chome, Kamiosaki Shinagawa-ku, Tokyo-to, Japan

Original No. 3,485,963, dated Dec. 23, 1969, Ser. No. 706,150, Feb. 16, 1968. Application for reissue Mar. 12, 1970, Ser. No. 19,130

Claims priority, application Japan, Feb. 20, 1967, 42/10,741

Int. Cl. G11b *5/00*

U.S. Cl. 179—100.2 4 Claims



A gravity-operated device causes an ON-OFF control mechanism to switch on either a recording circuit or a reproducing circuit in a miniature tape recorder depending on which of a recording side and an opposite reproducing side of the recorder is faced upward, the ON-OFF control mechanism being operated by a single button, [and rewinding is controlled by another single button clearly distinguishable from the ON-OFF button,] whereby there is little possibility of erroneous control manipulation even in the dark. The recording side accommodates a recording tape and the reproducing side contains a loudspeaker facing outward, whereby the entire tape recorder is miniaturized into a compact pocket size.

27,131

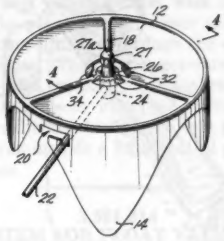
SPACE HEATER BASE PLATE CONSTRUCTION

Harry Franke, Mercer Island, Wash., assignor to Spot Heaters, Inc., Sunnyside, Wash.

Original No. 3,409,001, dated Nov. 5, 1968, Ser. No. 637,672, May 11, 1967. Application for reissue Sept. 29, 1969, Ser. No. 869,972

Int. Cl. A01g *13/06*

U.S. Cl. 126—59.5 9 Claims



A base plate construction for an outdoor space heater which includes a stack defining a chamber for burning a mixture of fuel and air, a base forming the bottom of the chamber and supporting the stack above the supporting surface, and means including a nozzle for delivering a spray of fuel to the heater. The base comprises a circular base plate having a central opening therein adapted to receive the nozzle in a position to spray a mist of fuel upwardly into the chamber, a plurality of arcuate apertures surrounding the nozzle receiving opening in the immediate proximity thereof, and arcuate fins secured to the base plate along the outer peripheries of the arcuate apertures and inclined convergently toward the head of said nozzle to direct air entering through the apertures toward the nozzle head to cool the same and effect mixture of the air with the fuel emanating therefrom.

27,132

APPARATUS FOR TREATING BLOOD

John C. Ilg, Fitzwilliam, N.H., assignor to Elliot Laboratories, Inc., Fitzwilliam, N.H.

Original No. 3,399,040, dated Aug. 27, 1968, Ser. No. 598,443, Dec. 1, 1966, which is a division of Ser. No. 331,342, Dec. 13, 1963, now Patent No. 3,328,255, dated June 27, 1967, which in turn is a continuation-in-part of Ser. No. 297,854, July 26, 1963. Application for reissue Dec. 1, 1969, Ser. No. 888,172

Int. Cl. A61m *1/03*

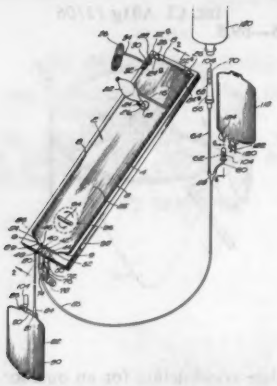
U.S. Cl. 23—258.5 41 Claims

A disposable, sterile closed system, including an elongated plastic blood bag, for freezing blood cells, washing the thawed blood cells to agglomerate the cells to form a lower agglomerated cell layer and an upper spent washant layer containing undesired materials removed from the cells.

The blood bag is sealed and is provided with a magnetic stirrer. Preferably, it comprises a pair of flat, transparent or translucent plastic panels normally collapsed against each other, has a wide portion and a narrower portion with the wider portion having at least twice the capacity of the narrower portion and the internal surfaces of the plastic bag panels are provided with longitudinal ribs to provide flow passages when the panels are squeezed together.

The bag is provided with an outlet and a satellite bag connected therewith for collecting washed blood cells.

One or more of the bags has a fitting or cannula connected to an inlet or outlet thereof over which is located a protective cap sealed to the fitting or cannula by a



plastic band shrunk therearound and is also provided with an inlet or outlet sealed by a cylindrical plug located therein and adapted to be forced out of the inlet or outlet into the bag by insertion of a cannula.

27,133

CERTAIN 4 - AMINO-3-OXAZOLINES HAVING HALOGENATED HYDROCARBON SUBSTITUENTS IN THE 2- AND 5-POSITIONS

William J. Middleton, New Castle, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original No. 3,442,904, dated May 6, 1969, Ser. No. 618,991, Feb. 27, 1967, which is a continuation-in-part of Ser. No. 555,974, June 8, 1966. Application for reissue Mar. 20, 1970, Ser. No. 21,558

Int. Cl. C07d *85/36*

U.S. Cl. 260—307 **20 Claims**

Certain 4-amino-3-oxazolines having halogenated hydrocarbon substituents in the 2- and 5-positions e.g., 4-amino-2,2,5,5-tetrakis(trifluoromethyl)-3 - oxazoline and 4-amino-2-difluoromethyl-6,6,7,7,8,8 - hexafluoro - 2 - trifluoromethyl-3-aza-1-oxaspiro[4,3]oct - 3 - ene and their tautomers, useful as plasticizers for polymeric materials, and their preparation, e.g., from reaction of a polyhaloisopropylidenimine, e.g., pentafluoroisopropylidenimine, and a polyhaloketone cyanhydrin, e.g., hexafluorocyclobutanone cyanhydrin, in a polar solvent and in the presence of a strongly basic amine.

27,134

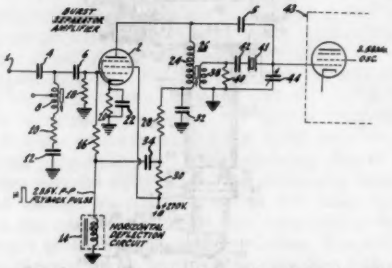
KEYED BURST SEPARATOR

John Norman Pratt, Indianapolis, Ind., assignor to RCA Corporation

Original No. 3,454,709, dated July 8, 1969, Ser. No. 584,770, Oct. 6, 1966. Application for reissue Jan. 19, 1970, Ser. No. 8,132

Int. Cl. H04n *9/46*

U.S. Cl. 178—5.4SY **10 Claims**



In a color burst separator tube, the flyback pulse is used to bias the tube into conduction and to boost the effective D.C. anode voltage during the burst interval.

27,135

READILY REMOVABLE DOUBLE HUNG WINDOW

Dawson J. Dinsmore, deceased, late of Sioux Falls, S. Dak., by Thomas J. Barron, executor, Sioux Falls, S. Dak., assignor to D. J. Dinsmore Co., Sioux Falls, S. Dak.

Original No. 3,358,404, dated Dec. 19, 1967, Ser. No. 523,784, Jan. 28, 1966. Application for reissue Dec. 8, 1969, Ser. No. 870,317

Int. Cl. E05d *13/12;* **E06b** *3/44*

U.S. Cl. 49—446 **9 Claims**

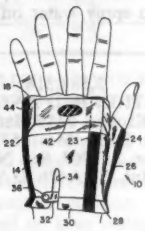
A readily removable window in which the balance assembly for the sash slides with the same and in which the balance assemblies are retained on the [*jamb*] *through the use of an adjustable stop mechanism to permit the sash to be slidably displaced in the frame and removed therefrom.*

PATENTS

GRANTED JUNE 1, 1971

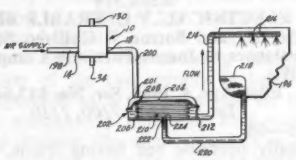
GENERAL AND MECHANICAL

3,581,312
BASKETBALL TRAINING GLOVE
Terrill Franklin Nickels, 9400 Fox, Allen Park, Mich. 48401
Filed May 21, 1969, Ser. No. 826,612
Int. Cl. A41d *19/00*
U.S. Cl. 2—159 **1 Claim**



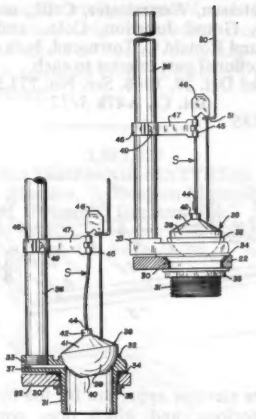
A glove for training basketball players to use their finger tips to control a basketball including a foam rubber member positioned across the palm of the glove adjacent the base of the fingers for preventing use of the palm to control the ball. The glove has no fingers but includes at least one member passing between the base of two adjacent fingers for maintaining the glove in position in use and includes elastic inserts for providing a maximum of freedom of use of the hand with the glove on.

3,581,313
PRESSURE TRANSFER VALVE
Elmer A. Haglund, 32125 Harborview Lane, Westlake Village, Calif. 91361; Ivan L. Marburger, 1315 Tulare Way, Upland, Calif. 91876; and Donald W. Howell, 1627 Victoria Place, La Verne, Calif. 91750
Continuation-in-part of application Ser. No. 867,043, Oct. 16, 1969. This application July 23, 1970, Ser. No. 57,563
Int. Cl. E05d *3/00;* **G05d** *7/00*
U.S. Cl. 4—26 **18 Claims**



A pressure transfer valve has a flexible pressure responsive diaphragm disposed between a lower pressure chamber and an upper pressure chamber. A valve inlet port connected to a source of fluid under pressure communicates with each pressure chamber, and a valve outlet port communicates with the lower pressure chamber through an upper valve seat. A manually operative movable plunger carried by the diaphragm is sealed at the upper valve seat so that both pressure chambers are initially subjected to inlet pressure. A valve vent port having a lower valve seat communicates with the outlet port. Movement of the plunger to the lower valve seat permits fluid under pressure to flow through the outlet port to a downstream system. When outlet pressure builds up to a predetermined value sensed by the diaphragm, the plunger automatically returns to its upper valve seat and the outlet pressure exhausts through the vent port. The downstream system can include a flush control pump connected to a toilet system.

3,581,314
LIFT STEM FOR FLOAT VALVE OF A WATER CLOSET TANK
Orvan J. Bennett, Fort Lupton, Colo., assignor to Orvan J. Bennett, Fort Lupton, Jack E. Bennett, Denver, and Aldena A. Bashor, Longmont, Colo.
Filed Apr. 14, 1969, Ser. No. 815,719
Int. Cl. E03d *1/34*
U.S. Cl. 4—56 **5 Claims**

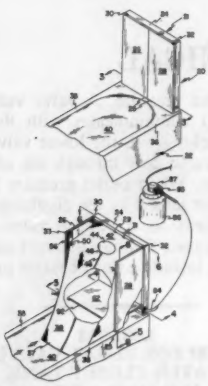


In the float valve assembly for a standard water closet tank, a lift stem characterized by adequate flexibility to permit the float valve of the water closet tank to rotate upon the outlet seat at the base of the tank whenever the float valve contacts the seat in an offset position.

3,581,315
STEAM BATH
Shirman Milliner, 610 East South Temple, Salt Lake City, Utah 84102
Filed Aug. 26, 1968, Ser. No. 755,305
Int. Cl. A61h *33/10*
U.S. Cl. 4—162 **17 Claims**

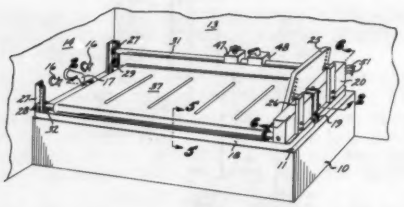
A steam bath with cabinet normally permanently joined to a wall, or built into a recess in a wall, adjacent a bathtub, the cabinet being foldable into a closed compact unit and having swinging doors which open to rest upon sides of the bathtub during use to expose a man-enclosing flexible envelope, such as substantially impervious fabric, attachable to the doors to cause the envelope to drape into the bathtub. A folding, internally attached seat is shifted

from a collapsed into a horizontal disposition and is secured to the doors in their open position, and structure



is provided for safely generating and thereafter introducing steam within the envelope.

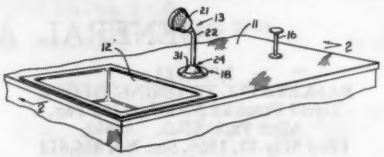
3,581,316
SHEET-TYPE ELEVATOR APPARATUS FOR STANDARD BATHTUBS
Edward A. Petersen, Westminster, Calif., assignor to Ted W. Babbel, Grand Junction, Colo., and Richard A. Townsend and Ronald C. Townsend, both of Santa Ana, Calif., a fractional part interest to each
Filed Oct. 29, 1968, Ser. No. 771,557
Int. Cl. A47k *3/12*
U.S. Cl. 4—185 **14 Claims**



A sheet-type elevator apparatus for use by elderly or incapacitated persons, and which does not require any alteration of a standard or conventional bathtub, or any mounting to the wall or floor. An adjustable rectangular frame is mounted on the rim of the tub, and has mounted thereon in parallel relationship two roller or spindle elements for the sheet. An adjustable housing is provided at one end of the frame and supports a hydraulic motor which is connected through worm gearing to the roller elements to operate the same. Control valves are provided on a handrail, over the frame, in order to effect the requisite operation of the motor to lower or raise the person using the apparatus. A blackrest is mounted on the frame and on the housing and aids in elevating or lowering the user and in making the user more comfortable while in the bathtub.

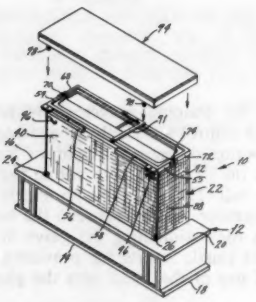
3,581,317
SPRAYER FOR DECONTAMINATION
Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Faucet Company, Berkeley, Calif.
Filed Mar. 13, 1968, Ser. No. 712,816
Int. Cl. E03c *1/00*
U.S. Cl. 4—187 **2 Claims**

A device for spraying water on the face, in the eyes, or on other parts of the body to decontaminate same of chemicals and other irritants which may be encountered in industry, laboratories, etc. The sprayer is arranged to be readily locked in position in a counter adjoining a sink to discharge water into the sink rather than upon



other surrounding areas. The sprayer may also be quickly withdrawn from its locked mounted position in the counter and manipulated to spray water on any desired portion of the body.

3,581,318
COMBINATION BED AND COUNTER
Hugo H. Kroupa, 3115 Hampton Ave., St. Louis, Mo. 63139
Filed Mar. 3, 1969, Ser. No. 803,778
Int. Cl. A47b *83/00*
U.S. Cl. 5—2 **6 Claims**

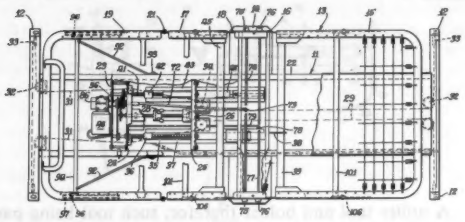


A combination bed and counter includes a base member and a foldable bed assembly having frame members with frame faces and perimetric edges. The foldable bed assembly is movably secured to the base member and is adapted to move from a first position wherein the flat faces are vertically disposed to a second position wherein the flat faces are horizontally disposed. The foldable bed assembly extends upwardly above the base member to support a counter top when in the first position.

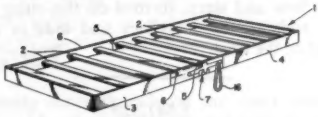
3,581,319
ELECTRICALLY OPERABLE BED
John F. Stanley and Barron J. Gulliver, Stevens Point, Wis., assignors to Joerns Furniture Company, Stevens Point, Wis.
Filed Apr. 4, 1969, Ser. No. 813,647
Int. Cl. A61g *7/00, 7/10*
U.S. Cl. 5—68 **10 Claims**

Electrically operable bed having frame, hi-low drive means for moving frame vertically, articulated spring with intermediate, head, knee and foot sections, drive means for raising and lowering head and knee sections, electric motor, transmission means mounted on frame for effecting actuation of drive means by motor, gear reducer and clutch interposed between motor and transmission means, function selector means mounted on frame for selectively determining which drive means will be actuated by transmission means including a key rotatable by the motor and axially slidable to effect selection, and rubber-cushion mounting of motor on frame including bolts disposed parallel to axis of rotation of key to facilitate ease of selective axial movements of key. Also includes movement-

limiting means interposed between head and knee sections of normally horizontal spring and frame operable to prevent downward movement of outer ends of head and knee sections below horizontal and selectively movable to permit rapid placing of spring in Trendelenburg, reverse Trendelenburg, or Hyperextension positions, comprising levelers having normally vertically depending arms pivotally mounted on head and knee sections and each having foot means engageable with frame, and normally inoperative levelers latches pivotally mounted on head and knee sections and manually swingable to operative position to cam associated leveler arm to, and retain same in, non-vertical inoperative position, subsequent downward swinging of head or knee section causing engagement of leveler with frame to release latch for automatic return to normal inoperative position, and the movement-limiting means also including foot section support means pivoted at inner end on frame and having transversely extending pin at outer end cooperatively engaging ratchet bracket mounted on foot section.

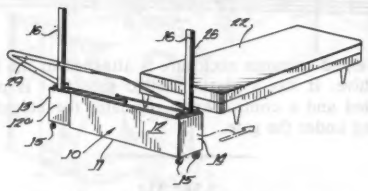


3,581,320
UNDER MATTRESS FOR RECLINING FURNITURE
Hugo Degen, Basel, Switzerland, assignor to Marpal AG, Chur, Switzerland
Filed Apr. 18, 1969, Ser. No. 817,390
Claims priority, application Switzerland, Apr. 19, 1968, 5,802/68
Int. Cl. A41c *19/00*; A61g *7/06*
U.S. Cl. 5—202 **5 Claims**



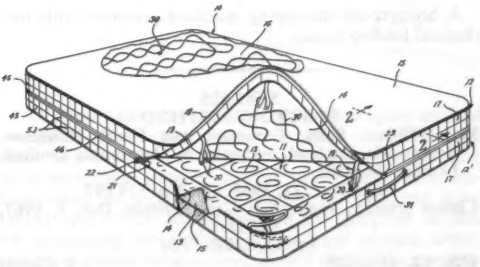
An under mattress for reclining furniture having a frame which is pivotally mounted in side portions of the reclining furniture and is subdivided into at least two sections which are relatively pivotable about an axis transverse to the longitudinal axis of the reclining furniture. The angular position of the two sections is lockable by a stop means operable by a person resting on the under mattress in a substantially horizontal stop position and one other stop position. The stop means has on each side of one frame section a pivotally mounted locking member overlapping the adjacent frame section to positively engage with locking means provided on the latter in each stop position of the under mattress but to adjustably engage in positions of the under mattress intermediate the stop positions, whereby the two frame sections can assume any relative angular relationship between the two stop positions in response to movements of a person resting on the under mattress, the stop means automatically becoming locked when the two frame sections reach said substantially horizontal stop position. The locking member is a lever provided with at least one downwardly extending catch and the locking means on the adjacent frame section comprises spaced-apart cams, the space between which corresponds to the dimensions of the said catch.

3,581,321
BED-MAKING APPARATUS
William M. Geary, 2639 W. 123rd St., Blue Island, Ill. 60406
Filed July 28, 1969, Ser. No. 845,474
Int. Cl. A47c *21/00*
U.S. Cl. 5—317 **10 Claims**



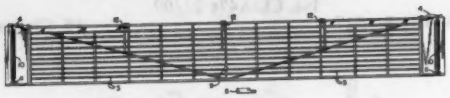
Apparatus for the making of beds including an adjustable frame structure for use with beds of widely varying widths and a telescoping tubular frame structure for varying its dimensions and adapted to be pivoted or rotated from a vertical to a horizontal position, extended from a retracted to an extended horizontal position with the extended frame sections disposed at the sides of the mattress, the longitudinally extended ends having pivotally mounted slotted tucker rods which receive and hold the ends of the sheets or bed covering and when the extended frame is retracted from its extended position tucks in the bed clothing.

3,581,322
WATERPROOF MATTRESS
Eugene A. Marsico, % Denison Mattress Factory, 1001–31 Owing St., Denison, Tex. 75020
Filed Mar. 3, 1969, Ser. No. 803,724
Int. Cl. A47c *23/00*
U.S. Cl. 5—351 **5 Claims**



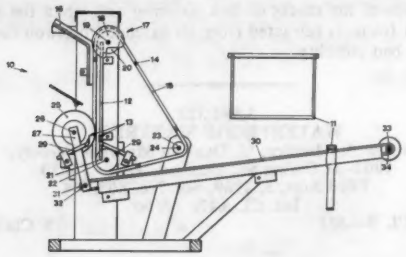
A mattress may comprise an inner spring and two panels above and below spring, each panel releasably anchored to the spring at its edge, each panel having a half boxing, the half boxings being releasably connected as by a zipper. Each panel may include an inner cover, a resilient urethane foam pad, and an outer scrim, quilted together with the cover and scrim in tension and the paid in compression, rendering the panel laterally rigid while transversely flexible. Each panel may further include an imperforate, waterproof outer cover attached at its periphery by a sealed inner seam to the outer edge of the half boxing, the latter also being waterproof, the half boxing being attached at its midline to the periphery of the inner cover. The half boxing may be a padded, quilted laminate with half of the zipper attached to its inner edge.

3,581,323
VENTED ENTRANCE ENCLOSURE FOR BEEHIVES
James Lawrence Rodgers, Augusta County, Va.
(P.O. Box 935, Burgaw, N.C. 28425)
Filed Dec. 24, 1968, Ser. No. 786,687
Int. Cl. A01k *47/06*
U.S. Cl. 6—4 5 Claims



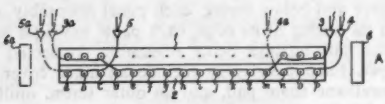
A vented entrance enclosure is attached to the front of a beehive. It has a plastic vented gate that is pivotally mounted and a control knob regulates the height of the opening under the gate.

3,581,324
HONEYCOMB UNCAPPING MACHINE
Robert Davidson, Jr., Hadlow 4, R.D., Timaru, South Island, New Zealand
Filed Dec. 18, 1968, Ser. No. 784,825
Claims priority, application New Zealand, Dec. 19, 1967, 149,503
Int. Cl. A01k *59/00*
U.S. Cl. 6—12 4 Claims



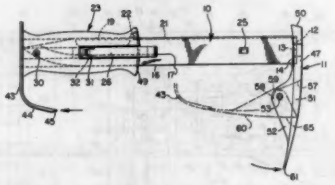
A honeycomb uncapping machine provided with mechanical loading means.

3,581,325
KNITTING METHOD
Max William Betts, Coventry, and Frank Robinson, Borrowash, England, assignors to Courtaulds Limited, London, England
Filed Nov. 12, 1968, Ser. No. 774,807
Claims priority, application Great Britain, Dec. 1, 1967, 54,711/67
Int. Cl. D04b *7/04*
U.S. Cl. 66—129 3 Claims



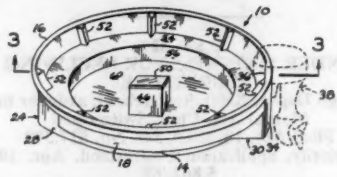
A method of knitting a panel for a single-knit jersey garment in which the panel is knitted on a machine having two opposed straight needle beds between which tubular fabric can be produced, at least one margin of the panel being knitted in tubular form contemporaneously with the knitting of the main part of the garment panel.

3,581,326
UNDERWATER UTILITY TOOL
Robert R. Hayes, Euclid, Ohio, assignor to John L. Fuller and Associates, Cleveland, Ohio
Filed May 15, 1969, Ser. No. 824,796
Int. Cl. B25f *1/02*
U.S. Cl. 7—8.1 16 Claims



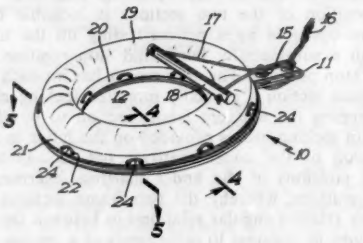
A utility tool and holder therefor, such tool being particularly suitable for underwater use and including a knife blade having an extensible pick on its butt end with a handle slidably mounted on the blade, such handle being latchable in alternate positions, in one position the tool being usable as a knife while in the other as a pick or hammer.

3,581,327
PLEASURE BOAT
Carl E. Eades, P.O. Box 701, Ferndale, Calif. 95536
Continuation-in-part of application Ser. No. 791,238, Jan. 15, 1969. This application Nov. 18, 1969, Ser. No. 877,705
Int. Cl. B63c; B63b *5/24*
U.S. Cl. 9—1 2 Claims



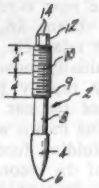
A substantially cup-shaped hull is provided with a hollow seat extending around the inner periphery of its wall. A hollow bow and stern, formed on the outer surface of the hull, adds to the buoyancy and aids in controlling movement of the boat.

3,581,328
WATER SPORTS VEHICLE
Eugene O. Smith, Victoria Heights, Alexandria, Minn. 56308
Filed May 13, 1969, Ser. No. 824,137
Int. Cl. A63c *15/00*
U.S. Cl. 9—310G 9 Claims



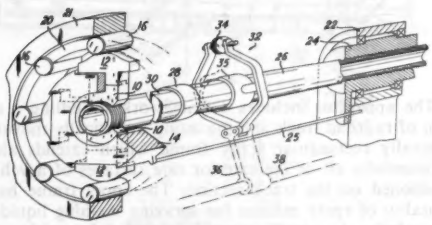
A water sports vehicle comprising a distorted disc that is curved up at the front, to a lesser degree at the sides and not at all at the rear combined with a resilient flotation seat.

3,581,329
PIERCE AND TAP DRIVER PIN FOR POWER-ACTUATED TOOL
Albert J. Duffield, Woodbridge, Conn., assignor to Olin Corporation
Filed May 29, 1968, Ser. No. 733,089
Int. Cl. B23g 5/20, 7/00
U.S. Cl. 10—140 6 Claims



For use with a power-actuated tool, a pin for piercing and tapping an aperture, which pin comprises piercing means formed at the forward end of the pin and thread tapping means formed rearwardly on the pin with an undercut portion disposed between the piercing and thread tapping means.

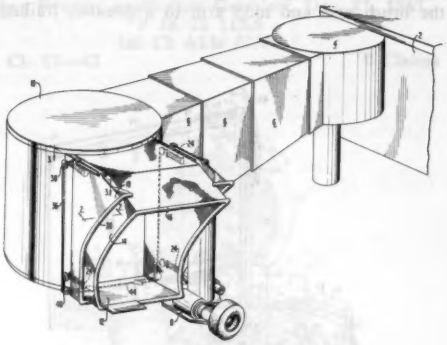
3,581,330
METHOD AND APPARATUS FOR FORMING THREADS BY RECIPROCATING HAMMERS
Yvan Ortel, Fontenay-aux-Roses, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Dec. 19, 1968, Ser. No. 785,129
Claims priority, application France, Dec. 28, 1967, 133,979
Int. Cl. B23g 7/00; B21h 3/02; B21k 1/56
U.S. Cl. 10—153 11 Claims



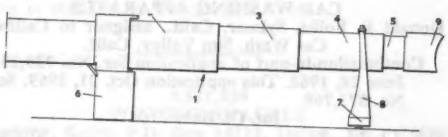
For forming screw-threads on the outer surface of a cylindrical rod by block jaws provided with an impression of the screw-thread to be formed and adapted to rotate as a single unit about an axis while being endowed with a simultaneous radial reciprocating movement towards and away from said axis, one of the components of a threaded coupling unit having a pitch equal to that of the screw-thread to be formed is driven in rotation about said axis in synchronism with said hammer-block jaws, the workpiece to be threaded is coupled to the second component of said coupling unit and said workpiece is caused to rotate with respect to said hammer-block jaws by being either driven or retained according to thread-forming requirements.

3,581,331
FIRE PROTECTION SHIELD
Perry N. Fisher, Huntsville, and Howard E. Morris, Florence, Ala., assignors to Brown Engineering Company, Inc.
Filed Oct. 1, 1968, Ser. No. 764,276
Int. Cl. B65g 11/00
U.S. Cl. 14—71 15 Claims

A shield for enclosing a platform between two enclosures is normally held in a retracted position spaced from one of the enclosures. In the presence of abnormally high temperatures generated by a fire, the shield is moved to its extended position where it encloses the platform. The shield, which may include a resilient sealing rim, is covered with a heat insulating material which expands in the presence of fire.



3,581,332
AIRPORT GANGWAY
Nicolaas Gradus Jan Willem van Marle, Dordrecht, Netherlands, assignor to Aviolanda Maatschappij voor Vliegtuigbouw N.V., Papendrecht, Netherlands
Filed Oct. 17, 1968, Ser. No. 765,490
Claims priority, application Netherlands, Oct. 5, 1967, 6713555
Int. Cl. B65g 11/00
U.S. Cl. 14—71 5 Claims

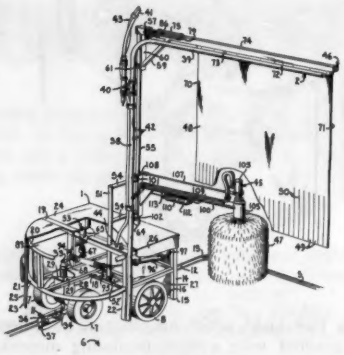


An airport gangway constituted by telescoping sections comprising a rearmost section pivotally connected to a stationary structure, a foremost section, and a plurality of intermediate sections, one of said intermediate sections being supported on a traveling carriage, and drive means operatively connected with the gangway section for telescoping the sections into and out of each other, said drive means being so coordinated that the movements between adjacent pairs of sections have a predetermined ratio to each other.

3,581,333
VEHICLE WASH APPARATUS
Gordon V. Lieffring, Kansas City, Mo., assignor to Robo-Wash Inc., Kansas City, Mo.
Filed June 9, 1969, Ser. No. 831,598
Int. Cl. B60s 3/06
U.S. Cl. 15—4 8 Claims

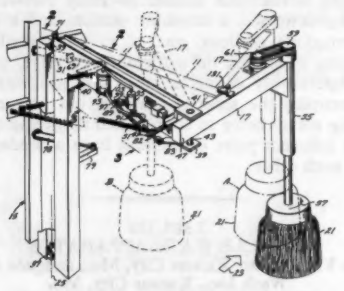
An automatic vehicle washing apparatus having a mobile carriage for movement along a predetermined path to wash a vehicle parked within such path. The improvement includes a standard swingably mounted on the carriage with a brush arm extending therefrom and supporting a brush assembly for engagement with side of

the vehicle during a washing cycle. The standard also supports an arm with a mop frame movable thereon and supporting a depending fabric member with strips for engaging the upper surfaces of the vehicle during the washing cycle. The apparatus has controls whereby at the end of the washing cycle the standard is swung to move the brush arm and mop arm to a position trailing the



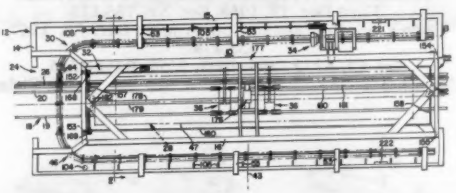
carriage and away from the vehicle. The apparatus has a structure responsive to change of direction of the carriage for moving the mop arm toward but spaced from the vehicle and thereby reduce the space required for the path of the apparatus. The apparatus has a brush resistance responsive member for moving the brush assembly outwardly to reduce the resistance thereby preventing the brush from catching on the corners of the vehicle.

3,581,334
CAR WASHING APPARATUS
Donald E. Follis, Sylmar, Calif., assignor to California Car Wash, Sun Valley, Calif.
Continuation-in-part of application Ser. No. 739,234, June 24, 1968. This application Oct. 31, 1969, Ser. No. 873,768
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 **17 Claims**



A car wash apparatus comprising a frame pivotally supporting first and second pivotal arms which carry a vertically extending rotary brush and are biased to respective normal positions extending transversely and along the path of a car to be washed. Control means is connected with the second arm and cooperates with the biasing means to apply a relatively large unfolding force to the second arm and to, after initial unfolding, apply a relatively small unfolding force to the second arm whereby the brush will be contacted by the front of the car and will be carried forwardly therewith to carry the free extremity of the first arm forwardly. After the brush has traveled across the front of the car and clears the front corner thereof, it will travel rearwardly along one side thereof folding the second arm on the first arm and when the rear corner of the car clears the brush, the biasing means and control means will cooperate to apply such relatively large unfolding force to the second arm to initially move the brush forwardly and inwardly relatively rapidly to commence inward travel across the rear of the car and, thereafter, such control means and biasing means will cooperate to apply the relatively small unfolding force to the second arm to continue unfolding of the second arm at a rate sufficient to effect thorough cleaning of the rear of the car.

3,581,335
APPARATUS FOR WASHING RAILWAY VEHICLES
Wallace J. Saxonmeyer, Park Forest, Ill., assignor to Whiting Corporation
Filed Oct. 6, 1969, Ser. No. 863,902
Int. Cl. B60s *3/04*
U.S. Cl. 15—53 **6 Claims**

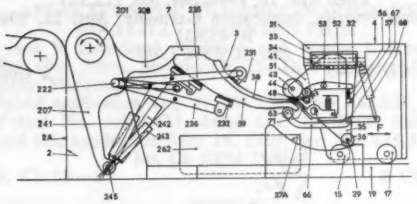


The apparatus includes a framework straddling a section of railroad track and mounting a vertically movable, generally rectangular spray frame which extends along substantially all of the exterior side surfaces of a vehicle positioned on the track section. The spray frame has a plurality of spray nozzles for spraying washing liquid on the vehicle. A control system is provided for raising and lowering the spray frame relative to the vehicle and for applying washing liquid from the spray nozzles while raising and lowering the spray frame. A scrubbing unit is mounted on a track which extends along each side of the railroad track and which crosses the section of railroad track at one end thereof. The scrubbing unit includes a brushing mechanism which can be raised and lowered and which can be extended to a position of engagement with the exterior side surfaces of the vehicle.

3,581,336
MACHINE FOR BONING THE FORE QUARTERS OF BUTCHER'S MEAT
Jean Frédéric Herubel, 1 Rue du 4 Fevrier, Guebwiller, Haut-Rhin, France
Filed Apr. 12, 1968, Ser. No. 720,953
Claims priority, application France, Apr. 14, 1967, 102,746; Feb. 29, 1968, 141,791
Int. Cl. A22c *17/04*
U.S. Cl. 17—1 **34 Claims**

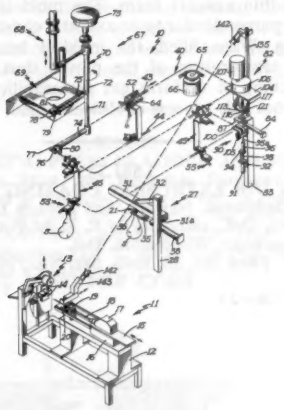
This invention relates to machines for removing the bones from the forequarters of butcher's meat, of the type comprising a support fitted with means for fixing the

quarter of meat to be boned and a thin-edged tool which is capable of moving relatively to the said support at least in one longitudinal direction with respect to the



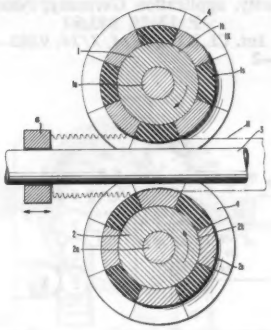
direction of the ribs of the meat quarter in such a manner as to engage between the ribs and the meat in order to separate this latter from the bones.

3,581,337
APPARATUS HANDLING SYSTEM FOR USE IN A DEBONING OPERATION
John A. Tonjum, Gerald L. Helgeson, and John G. Lunn, Austin, Minn., assignors to Geo. A. Hormel & Company, Austin, Minn.
Filed Aug. 28, 1969, Ser. No. 853,743
Int. Cl. A22c *17/04*
U.S. Cl. 17—1G **12 Claims**



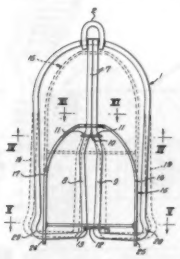
An apparatus system for use in a deboning operation in which bones are extracted from chunks of meat, comprises a conveyor device including a plurality of support mechanisms which engage the external fitting of the pin device applied to the embedded bones of a chunk of meat to permit each chunk of meat to be continuously and mechanically transferred to the deboning unit. The conveyor device also includes a plurality of support mechanisms which receive the pin devices and extracted bones attached thereto from the deboning unit so that the pin devices and attached bones can be transferred to a pin removal apparatus wherein the pin devices are continuously and mechanically disengaged from the extracted bones. Means are also provided for transferring the pin devices after separation from the extracted bones to a bone pinning machine where the pin devices are again applied to the bones in each chunk of meat.

3,581,338
APPARATUS FOR SHIRRING ARTIFICIAL SAUSAGE CASINGS
Hugo Bender, Wiesbaden-Erbenheim, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden, Biebrich, Germany
Filed Dec. 26, 1968, Ser. No. 786,993
Claims priority, application Germany, Dec. 27, 1967, P 16 32 115.6
Int. Cl. A22c *13/00*
U.S. Cl. 17—42 **5 Claims**



This invention relates to an apparatus for shirring sausage casings which comprises a mandrel, a movable abutment adapted to be contacted by the end of a shirred casing, and a plurality of rotatable conveyor wheel means having grooved rims mounted adjacent the mandrel and being adapted to engage a sausage casing, the grooved rims being divided into a plurality of segments of different coefficients of friction and segments having said different coefficients being opposite each other where the sausage casing is engaged by the grooved rims.

3,581,339
POULTRY SHACKLE
Donald P. Smith, P.O. Box 14212, Dallas, Tex. 75234
Filed Oct. 20, 1967, Ser. No. 676,841
Int. Cl. A22b *1/00*
U.S. Cl. 17—44.1 **10 Claims**



A device for suspending poultry such as chickens and turkeys on a conveyor for defeathering and eviscerating same which includes a frame with a slide movably attached thereto, the sides of the frame and the slide being relatively tapered so that the legs of a fowl can be

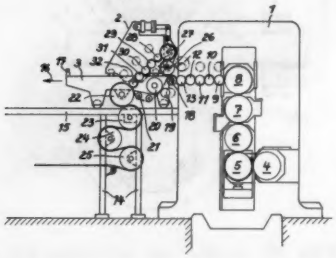
grippingly engaged therebetween for suspension in head-down position for defeathering and evisceration, but which may be relatively moved to readily release the legs of the fowl for disengagement from the suspending device.

3,581,340

CALENDERS, PARTICULARLY IN DRAWING CALENDERS FOR THE PRODUCTION OF WEBS OF FOIL OR FILM

Uwe Thieme, Willich, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed Nov. 19, 1968, Ser. No. 776,999
Claims priority, application Germany, Nov. 30, 1967, P 17 29 043.6
Int. Cl. B29d *7/14, 7/24, 9/02*
U.S. Cl. 18—2 6 Claims



A calender, particularly a drawing calender for the production of foil webs from rubber or thermoplastic materials, followed by optional racking and embossing means, the racking means and the embossing means each being lodged in a separate carriage capable of travelling between a working position close to the calender and an idle position, the two carriages being mounted one above the other for parallel running, and the lower carriage being provided, at the end adjacent to the calender, with an overhanging bowl which can also serve as a guiding roller.

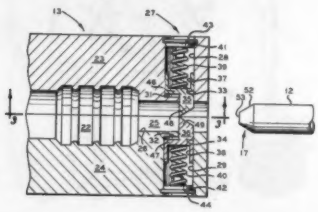
The upper carriage may be mounted upon the lower carriage, for travelling thereon.

3,581,341

GATE SHUT-OFF DEVICE FOR FOAM MOLDING

Dan E. Perry, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Feb. 6, 1969, Ser. No. 797,120
Int. Cl. B29d *27/04*
U.S. Cl. 18—5 6 Claims



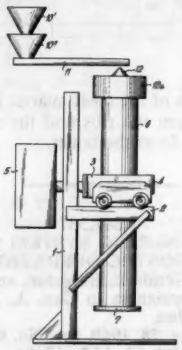
An apparatus for closing the gate of a mold used in foam molding. The apparatus comprises a pair of opposed closure members located on opposite sides of the gate. The closure members are normally disposed in a closed position and are movable to an open position responsive to the insertion of an extrusion lance through the gate.

3,581,342

APPARATUS FOR MANUFACTURE OF POROUS THIN-WALLED TUBING

Otto Ewald Dietzel, Gelsenkirchen-Buer, and Rudolf Hesse, Oberhausen-Sterkrade, Germany, assignors to Ruhrchemie Aktiengesellschaft and Mannesmann Aktiengesellschaft

Filed Apr. 18, 1968, Ser. No. 722,333
Claims priority, application Germany, Apr. 22, 1967, R 45,831
Int. Cl. B29c *1/00*
U.S. Cl. 18—5 2 Claims



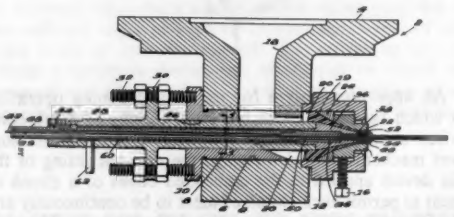
A method for the production of thin-walled tubes from particulate sinterable plastic, comprising the introduction of a suitable plastic at a uniform rate of flow into a mold having a thin annular form. The mold is vibrated in a direction perpendicular to its axis at a constant rate during the filling. When filled, the mold is heated above the sintering temperature of the plastic thus forming thin-walled tubing of uniform gas permeability. A mold for carrying out this process is also disclosed.

3,581,343

TUBING DIE EXTRUSION COATING APPARATUS

Arnold Henrikson, Newark, and Francis H. Skewis, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 25, 1968, Ser. No. 770,674
Int. Cl. B29f *3/10*
U.S. Cl. 18—13 12 Claims



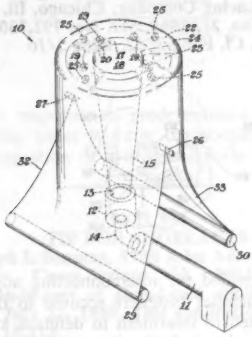
A separate guide structure is positioned within the guide tube of a tubing die extrusion coating apparatus for extrusion coating elongate material with thermoplastic resin, with the separate guide structure dividing the interior of the guide tube into a guide passage for elongate material passing through the guide tube and a vacuum chamber annularly surrounding the guide passage, with the guide passage terminating in laterally spaced relationship within the outlet of the guide tube, whereby the space between

the guide passage and the outlet of the guide tube insures free communication of the vacuum within the vacuum chamber of the guide tube with tubing of thermoplastic resin extruded by the apparatus.

3,581,344
APPARATUS FOR THE PREPARATION OF BIAXIALLY ORIENTED FILM

Edward R. Sederlund, Saginaw, and Walter J. Schrenk, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Original application Aug. 21, 1967, Ser. No. 662,028, now Patent No. 3,472,924, dated Oct. 14, 1969. Divided and this application May 16, 1969, Ser. No. 825,311
Int. Cl. B29d *23/04*
U.S. Cl. 18—14 **8 Claims**

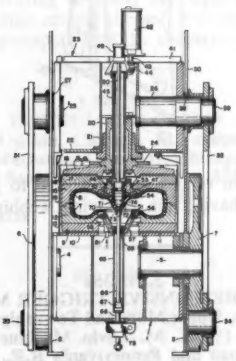


Biaxially oriented thermoplastic resinous film is prepared by extruding a tube, stretching the tube by means of generally coaxially arranged tori, at least the outermost torus being driven in frictional engagement with the film being prepared.

3,581,345
TIRE CURING PRESS BLADDER ASSEMBLY

Ernest S. Ulm, Stow, and Benjamin Stoyanov, Akron, Ohio, assignors to AMK Subsidiary Corp., Akron, Ohio

Original application Jan. 19, 1967, Ser. No. 610,419, now Patent No. 3,471,895, dated Oct. 14, 1969. Divided and this application Oct. 7, 1969, Ser. No. 864,415
Int. Cl. B29h *5/02*; B29c *3/00*
U.S. Cl. 18—17 **17 Claims**

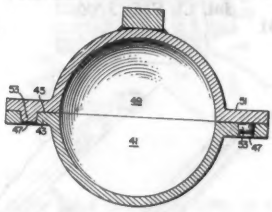


A tire curing press having upper and lower complementary mold sections and a readily replaceable bladder shaping assembly urged by a post assembly to its axially extended position. A pilot on the loader and movable mold section is received in a socket on bladder and post assembly during loading and shaping operations of press cycle. A chuck underlies a bead of cured tire as press is opened to strip same from stationary mold section for movement with movable mold section.

3,581,346
CENTRIFUGAL CASTING MOLD

Harry C. Schroeder, 1625 Graham Road, Stow, Ohio 44224

Continuation-in-part of abandoned application Ser. No. 777,646, Nov. 21, 1968. This application Apr. 30, 1969, Ser. No. 820,372
Int. Cl. B29c *5/04*
U.S. Cl. 18—26 **7 Claims**

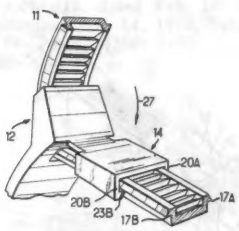


The invention deals with an improved aluminum, multipart receptacle type of casting mold for the centrifugal casting of granular or powder from thermoplastic materials; the improvement residing in the use of smooth surfaced flanges and unique registering means at the parting line between mold parts; the registering means being comprised of elongated, generally rectangular and tapered registering lugs on the upper mold part cooperating with similarly shaped register openings on the lower mold part to facilitate cleaning of the abutting faces of the parts.

3,581,347
RING CLAMP

Jean-Pierre Verspieren, Limoges, France, assignor to Legrand S.A., Limoges, France

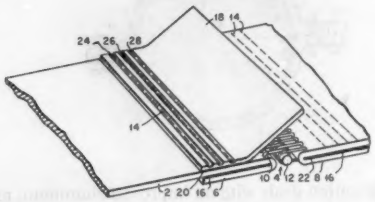
Filed Mar. 4, 1970, Ser. No. 16,323
Claims priority, application France, Mar. 7, 1969, 6,368; Jan. 15, 1970, 1,395
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 **17 Claims**



A ring clamp of one-piece construction is formed of plastics material and includes a flexible strap adapted to be secured in position in a fastening head. The fastening head is disposed at one end of the strap and a boss provided with a passage for receiving the strap is disposed adjacent to the fastening head. The fastening head is provided with a series of transverse ratchet teeth adapted for engagement with a series of ratchet teeth provided on the strap. Longitudinal securing teeth are provided on the

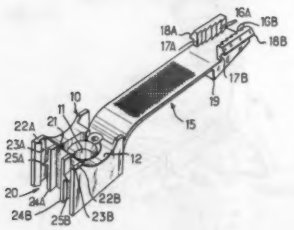
fastening head for maintaining the ratchet teeth in engagement with one another. The boss includes a retaining member for aiding the tightening of the ring clamp before the ratchet teeth are in engagement. The ring formed when the ratchet teeth are in engagement can be opened by resiliently deflecting the securing teeth out of engagement with the strap. The ratchet teeth on the fastening head as well as another cooperating pair of securing teeth for engagement with the first pair of securing teeth may be provided on a flap hinged to the fastening head.

3,581,348
SEAMS FOR PAPERMAKING CLOTHING
Thomas Jack Lister, Greeneville, Tenn., assignor to Huyck Corporation, Rensselaer, N.Y.
Filed July 27, 1970, Ser. No. 58,237
Int. Cl. F16g *3/00*
U.S. Cl. 24—31 **18 Claims**



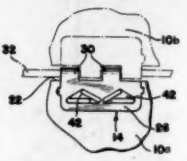
This invention relates to seams for joining together the ends of conveyor belts used in paper manufacturing that include means for flexibly interconnecting the ends, and comprises a flap having at least one channel, which flap covers all of the connecting means and is affixed to the paper contacting surface of said belt by yarns which are positioned in said flap.

3,581,349
RING CLAMP
Jean-Pierre Verspieren, Limoges, France, assignor to Legrand S.A., Limoges, France
Filed Mar. 2, 1970, Ser. No. 15,436
Claims priority, application France, Mar. 7, 1969, 6,368
Int. Cl. B65d *63/00*
U.S. Cl. 24—16PB **6 Claims**



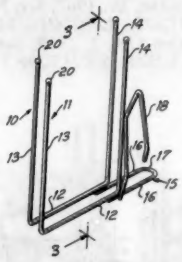
A ring clamp of one-piece construction is formed of plastics material and includes a flexible strap adapted to be secured into position in a fastening head. The fastening head is disposed at one end of the strap and a pair of flanges each having a series of upstanding ratchet teeth and a longitudinal securing tooth. The fastening head includes a pair of ratchets each of which is adapted for engagement with one of the series of ratchet teeth of the strap and a pair of securing teeth adapted for engagement with the securing teeth on the fastening head. In order to secure a cylindrical member in the ring clamp, the corresponding ratchet teeth are simultaneously brought into engagement as at least one of the pair of securing teeth are resiliently deflected and brought into cooperation with the other pair of securing teeth. The engagement of the ratchet teeth allows the further tightening of the ring clamp but prevents further loosening of the ring clamp. The ring clamp can be opened by resiliently deflecting the securing teeth out of engagement with one another.

3,581,350
BELT SPLICE AND SPLICER
Frank E. McComb, River Forest, Ill., assignor to Flexible Steel Lacing Company, Chicago, Ill.
Filed Jan. 21, 1969, Ser. No. 792,330
Int. Cl. F16g *3/02*; B25c *5/16*
U.S. Cl. 24—33 **14 Claims**



A splice is provided for interconnecting adjacent belt end edges and includes fasteners secured to the belt by staples and adapted to intermesh to define a knuckle for receiving a hinge pin. A device is provided which is particularly adapted to drive the staples which secure the fasteners in place.

3,581,351
JOINER PIN
Nicholas G. Murgolo, 400 Maplegrove Ave., Uniondale, N.Y. 11553
Filed Apr. 15, 1969, Ser. No. 816,298
Int. Cl. A44b *21/00*
U.S. Cl. 24—84 **7 Claims**

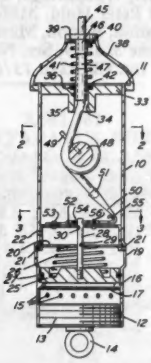


This invention relates to a pin used to join a pair of drapery units having pin receiving webbing at the top edge thereof.

3,581,352
IMMERSION RESPONSIVE TRIGGER MECHANISM
Aaron M. Lavin, Upper Moreland Township, Montgomery County, Pa. (% A. M. Lavin Machine Works, Inc., Davisville Road and Pennsylvania R.R., Hatboro, Pa. 19040)
Filed Dec. 19, 1969, Ser. No. 886,493
Int. Cl. F16g *11/00*
U.S. Cl. 24—123 **9 Claims**

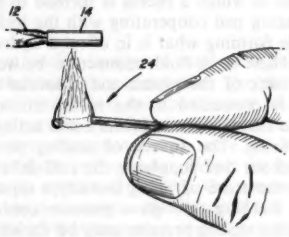
An immersion responsive trigger mechanism is provided which includes a normally closed housing having

a cord extending from one end and a connecting ring at the other end. A piston is provided in the housing



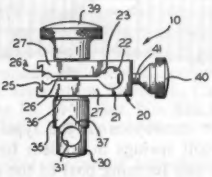
movable in response to predetermined water pressure for permitting water to enter the housing and effect the quick disintegration of a link to release the cord.

3,581,353
TIP FOR SHOELACES
Ralph I. Sonntag, 5908 John Adams Drive, Camp Springs, Md. 20031
Continuation-in-part of abandoned application Ser. No. 843,963, July 23, 1969. This application Mar. 3, 1970, Ser. No. 16,213
Int. Cl. A43c *9/00*
U.S. Cl. 24—143 **9 Claims**



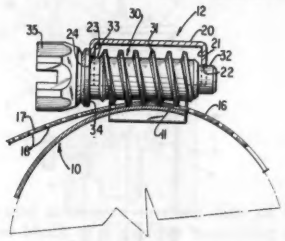
A tip attachable to a shoelace merely by heating with a match, the tip being made of heat shrinkable plastic tubing bearing normally dry, heat reactivated adhesive on the inner surface thereof. Alternatively, the adhesive can be pre-applied to the shoelace material.

3,581,354
INSTRUMENT CLAMP
Charles A. Usiskin, Chicago, Ill., assignor to Enco Manufacturing Company, Chicago, Ill.
Filed Sept. 16, 1969, Ser. No. 858,461
Int. Cl. A44b *21/00*
U.S. Cl. 24—81H **7 Claims**



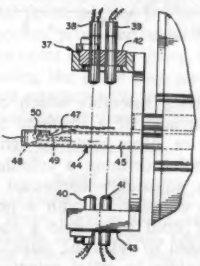
The invention is directed to a clamp used for mounting an instrument such as a dial indicator or a test indicator on a support stand. The clamp is so constructed that a test indicator having one or more different types and sizes of mounting means can readily be accommodated as can various sizes and types of support stands.

3,581,355
ANTI-BACKOUT WORM DRIVE CLAMP
Erwin L. Schaub, Plandome, N.Y., assignor to Ideal Corporation, Brooklyn, N.Y.
Filed Nov. 20, 1969, Ser. No. 878,286
Int. Cl. B65d *63/00*
U.S. Cl. 24—274 **7 Claims**



A worm drive bond clamp for hose or the like, made with a sheet metal housing having radial end walls formed with arched openings to seat front and rear journal portions of a worm screw fixed in the housing, has the screw formed with a thread root diameter and a rear journal diameter that fit the arch of the rear end wall opening, and with a circumferential ridge of greater diameter between the rear journal portion and the rearmost turn of the thread, so that the screw can be inserted by screwing its thread through the rear opening and forcing the ridge through space provided at the base of that openings by elastic upward deflection of the rear end wall, whereupon the ridge abuts the inner side of the rear end wall to prevent the screw from being screwed backwardly out of the housing. The screw is formed by rolling a headed metal screw blank between thread forming dies having journal forming dies fixed along their opposite side edges, without need for any turning or shaving operation.

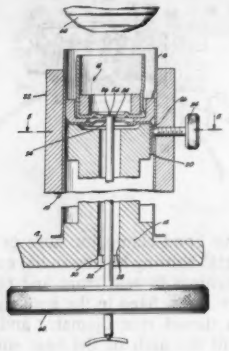
3,581,356
PNEUMATIC FABRIC EDGE DECURLER
Eugene Cohn, Great Neck, and Frank Catallo, Elmont, N.Y., assignors to Samcoe Holding Corporation, Woodside, N.Y.
Original application Jan. 25, 1967, Ser. No. 611,609, now Patent No. 3,494,011, dated Feb. 10, 1970. Divided and this application Jan. 14, 1970, Ser. No. 2,730
Int. Cl. D06c *3/00*
U.S. Cl. 26—54 **5 Claims**



A pneumatic device for flattening and decurling fabric edges is disclosed. The new device is in the form of a relatively straight air tube extending inward from a point outside the fabric edge. The outlet of the tube directs air

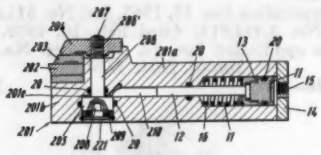
outwardly along the fabric surface toward its edges and can be utilized in many locations in a fabric processing line as a spot decurler.

3,581,357
ELECTRON GUN ALIGNMENT METHOD AND DEVICE THEREFOR
Frederick G. Oess, Oceanside, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Original application Jan. 2, 1968, Ser. No. 695,078, now Patent No. 3,510,926, dated May 12, 1970. Divided and this application Oct. 8, 1969, Ser. No. 871,198
Int. Cl. H01j *9/18, 9/36*
U.S. Cl. 29—25.16 **4 Claims**



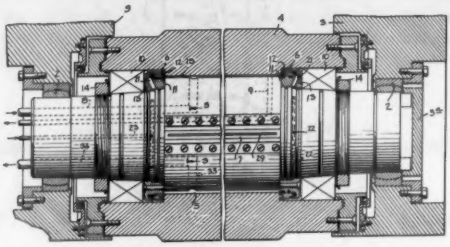
An aligning jig and method of operation to precisely align the G1 and G2 electrode apertures of an electron gun is disclosed. An aligning mandrel is positioned in one aperture and adjacent the other and rotated to view misalignment. The supporting cylinder is then manually distorted to produce aperture alignment.

3,581,358
TOOL SUPPORTING ASSEMBLY
Alfred Ledergerber, Bielefeld, Germany, assignor to Werkzeugmaschinenfabrik Gildemeister & Comp. Akt.-Ges. am Hauptbahnhof, Bielefeld, Germany
Filed May 23, 1969, Ser. No. 827,406
Int. Cl. B26d *1/12*
U.S. Cl. 29—96 **12 Claims**



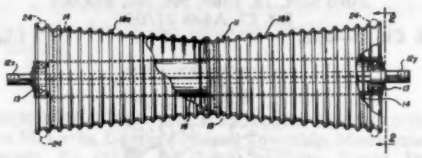
A tool supporting assembly which can be secured to the turret or carriage of a machine tool to support a turning, milling or other material removing tool comprises a tool holder defining a cylinder chamber for a piston which is adjustably connected with a movable clamping device cooperating with a portion of the tool holder to either hold or release a tool. The piston is permanently biased to releasing position but cooperates with the tool holder to effect retention of the tool in requisite position in response to admission of a hydraulic or pneumatic fluid into the cylinder chamber. The fluid can be admitted by a two-stage piston, by a screw or by a valve which is installed in a conduit connecting a bore of the tool holder with a source of pressurized fluid.

3,581,359
HYDROSTATIC BEARING TYPE SEAL FOR A CONTROLLED DEFLECTION ROLL
Samuel S. Board, Jr., Woodbridge, George R. Cournoyer, Huntington, and Peter Hold, Milford, Conn., assignors to USM Corporation, Boston, Mass.
Filed June 3, 1969, Ser. No. 829,930
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 **5 Claims**



A controlled deflection roll has a non-rotative shaft and a superimposed roll shell with radial space between the two. End and axially extending seals are connected to the shaft and bear against the inside of the roll shell to divide the space into two compartments, into one of which liquid is introduced under pressure so that when the roll shell is working against a counter roll under pressure, the deflection of the roll shell is controlled by the pressure on the liquid with consequent opposite beam deflection of the shaft. One or more of these seals, and preferably all of them, is formed by a piston which reciprocates in a recess in the shaft to and from the inside of the roll, this piston having an outer surface facing this inside and in which a recess is formed to form a hydrostatic bearing pad cooperating with the inside of the roll, this inside forming what is in effect a hydrostatic bearing runner. There is a fluid connection between this recess and the back of the piston and a source of fluid under pressure is connected to the recess through a flow restrictor so that the piston forms a seal acting like a hydrostatic bearing. The source of sealing pressure may be separate from that supplying the roll deflection pressure, either in the sense of being literally a separate source or a source working through a pressure controlling system, whereby the sealing pressure may be varied independently of the roll deflection controlling pressure.

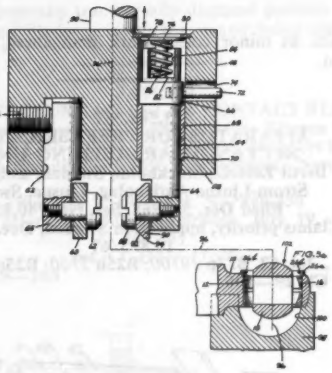
3,581,360
ROLLER FOR SPRING BELT CONVEYORS
Abe D. Penn, 1220 S. Acoma St., Denver, Colo. 80223
Filed Mar. 24, 1969, Ser. No. 809,682
Int. Cl. B65g *15/60, 39/071*
U.S. Cl. 29—116 **9 Claims**



A roller for conveyors of the type having a plurality of elongated coil springs in endless formation interfitting roller grooves and forming part of the power transmission system of the conveyor as well as supporting objects being conveyed on a stretch of the endless surface, said roller comprising a hollow central shaft, means at each end for

supporting the shaft for rotation, a shell having at least one portion tapering outwardly from an intermediate supported position to a second supported position at an outer end of the shaft, and the exterior tapering surface being grooved throughout substantially its lengthwise extent for supporting coil spring components of the conveyor.

3,581,361
METHOD AND APPARATUS FOR FABRICATING A BALL AND SOCKET ASSEMBLY
Robert J. Loubier, Fort Wayne, Ind., assignor to Tuthill Pump Company, Chicago, Ill.
Filed Dec. 13, 1968, Ser. No. 783,642
Int. Cl. B23p *11/00, 19/04*
U.S. Cl. 29—149.5B **10 Claims**

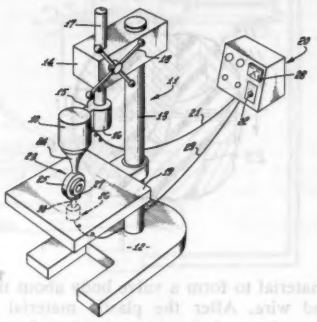


The present invention involves a method of fabricating a ball and socket assembly comprising the steps of inserting an out-of-round ball member into a socket having a protruding portion, and forming this protruding portion into operative engagement with only the larger diameter portions of the ball member. When the ball member is swung to its operative position, the necessary free-swiveling clearances are automatically provided.

The apparatus of this invention includes a supporting frame for holding a workpiece in position, a first tool movable in a predetermined direction for exerting a coining force on a workpiece held in the supporting frame in a direction transverse to said predetermined direction, a second tool for exerting a coining force on the workpiece in a direction substantially parallel to said predetermined direction, means for moving the first and second tools sequentially into engagement with the workpiece with the first tool engaging the workpiece in advance of the second tool, and means for rotating the first and second tools in unison relative to the supporting frame whereby both said tools may perform a coining operation on the workpiece.

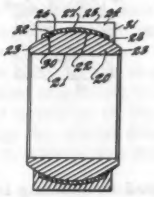
3,581,362
METHOD OF TREATING BEARINGS WITH ULTRASONIC VIBRATIONAL ENERGY
Peter Turner, Granada Hills, Calif., assignor to Kahr Bearing Corporation, Burbank, Calif.
Filed June 12, 1969, Ser. No. 832,582
Int. Cl. B32p *11/00*
U.S. Cl. 29—149.5 **10 Claims**

Electrical-mechanical vibration transducer means are employed to introduce mechanical vibrations into the race of a swaged spherical bearing to stabilize the race, reduce swaging forces required, eliminate "spring back" of the race away from the inner bearing member, and to produce a desired preload torque value between the inner and outer bearing members; an accelerometer means is provided for measuring the amplitude of vibrations of the bearing race to determine the resonant frequency of the



race or race and associated swaging dies of a swaging press or pillow block of a preload measuring apparatus; and methods and means for applying and terminating the application of variable frequency oscillations to the transducer means.

3,581,363
METHOD OF MAKING SELF-ALIGNING PLASTIC LINED BEARINGS
Franz J. Roesner, Trenton, and Robert C. Bogdan, Titusville, N.J., and Peter S. Breene, Philadelphia, Pa., assignors to Roller Bearing Company of America, West Trenton, N.J.
Original application Mar. 28, 1968, Ser. No. 716,910, now Patent No. 3,528,710, dated Sept. 15, 1970. Divided and this application Apr. 18, 1969, Ser. No. 836,188
Int. Cl. B23p *11/00*
U.S. Cl. 29—149.5 **5 Claims**

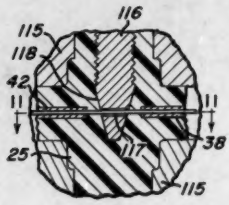


A method of making self-aligning bearings, by providing an outer race having a spherical internal pocket with shoulders at the ends, breaking the outer race at a least one circumferential point, placing a plastic lining around the inside of the pocket, providing a ball to fit in the outer race, expanding the outer race and lining, inserting the ball therein and contacting the outer race and lining to bring the lining into firm contact with the outside of the ball and retaining the ends by the shoulders in the pocket.

3,581,364
METHOD OF MOLDING A PLASTIC VALVE BODY
Harold G. Wyse, Dayton, Ohio, assignor to Gad-Jets, Inc., Dayton, Ohio
Original application Mar. 17, 1967, Ser. No. 624,053, now Patent No. 3,455,513, dated July 15, 1969. Divided and this application May 26, 1969, Ser. No. 827,632
Int. Cl. B29d *3/00*
U.S. Cl. 29—157.1 **3 Claims**

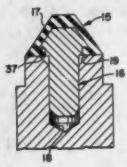
A mandrel having external threads and an inner end portion with an opening extending therethrough and con-

forming to the configuration of a valve seat is positioned in a mold cavity. A small tube is positioned in space relation to the mandrel in alignment with the opening in the mandrel and a wire is extended through the cavity, tube, and opening in the mandrel. The mold cavity is filled with



plastic material to form a valve body about the mandrel, tube, and wire. After the plastic material has cured, the wire and mandrel are removed and an adjustable valve member is inserted into the chamber formed by the mandrel. A plurality of such chambers may be formed in the valve body.

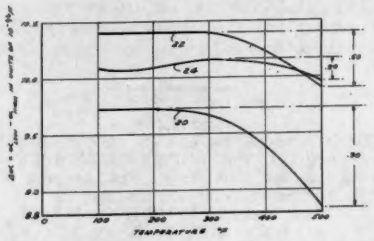
3,581,365
METHOD OF MAKING VALVE ELEMENT WITH MOLDED RESILIENT TIP
Myles N. Murray, Chagrin Falls, Ohio, assignor to Industrial Electronic Rubber Company, Twinsburg, Ohio
Original application Dec. 8, 1965, Ser. No. 521,233, now Patent No. 3,445,089, dated May 20, 1969. Divided and this application Aug. 26, 1968, Ser. No. 755,235
Int. Cl. B21d *53/00*; B21k *29/00*
U.S. Cl. 29—157.1 **5 Claims**



The tip is formed by molding rubber about the head of a metal pin, the pin is forced into an end socket of an elongated body to complete the element. The pin has a shoulder under the head which spaces the bottom of the head from the bottom of the mold cavity, so that some rubber is under the head for mechanical locking, and the shoulder seals the cavity opening through which the extension of the pin projects for exposure in the finished tip part. The separately formed element body can be made of metal or plastic.

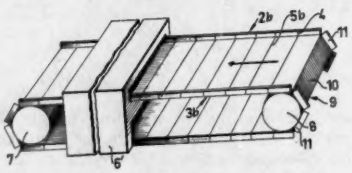
3,581,366
THERMOSTATIC BIMETAL
Arnold Gottlieb, Colonia, and George A. Majesko, Glen Ridge, N.J., assignors to Wilbur B. Driver Company
Filed Dec. 9, 1968, Ser. No. 782,070
Int. Cl. B32b *15/00*
U.S. Cl. 29—195.5 **2 Claims**

A thermostatic bimetal having enhanced temperature dependent characteristics such as the amount and linearity of deflection and developed force as well as an extended temperature range of maximum sensitivity. The bimetal employs a low expanding component containing, as major constituents, 30.75%–31.75% by weight of nickel, 6.5%–8.5% of cobalt, balance iron. This component can also



contain, as minor constituents, manganese, carbon and silicon.

3,581,367
APPARATUS FOR PREFABRICATING RECTANGULAR BUILDING UNITS
Bertil Zeinetz, Stockholm, Sweden, assignor to Strom-Ljusne Aktiebolag, Ljusne, Sweden
Filed Dec. 3, 1968, Ser. No. 780,814
Claims priority, application Sweden, Dec. 8, 1967, 16,893/67
Int. Cl. B23p *19/00*; B25h *5/00*; B25c *7/00*
U.S. Cl. 29—200 **7 Claims**

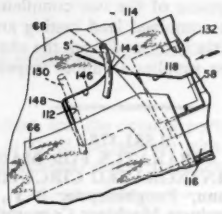


Apparatus for prefabricating building units and including a support on which the various elements of the building units are placed and guide members mounted on the support in a position to receive and maintain the building elements in predetermined locations.

3,581,368
SHEAR MECHANISM
Martin Gilvar, Westboro, Mass., assignor to Morgan Construction Company, Worcester, Mass.
Filed Apr. 24, 1969, Ser. No. 818,862
Int. Cl. B23p *19/04*
U.S. Cl. 29—200 **10 Claims**

An apparatus for dividing and shearing a continuously descending helical formation of rings. The apparatus includes a generally cylindrical wall defining a chamber through which the rings descend under the influence of gravity. A plurality of circumferentially spaced intercepting pins move axially through the wall into the chamber to temporarily interrupt the descent of rings, with the rings above the intercepting pins thereafter being connected to the rings therebelow by at least one connecting strand. A horizontally movable gate and a pivotal arm then move into the path of ring descent at a level below that of the intercepting pins to confine the connecting strand within a restricted cross-sectional area of the chamber. The strand is then sheared between a blade on the pivotal arm and a second blade which moves through the

chamber wall into the restricted area. Guide members movable with the second blade cooperate with the pivotal arm and the gate to locate the connecting strand between



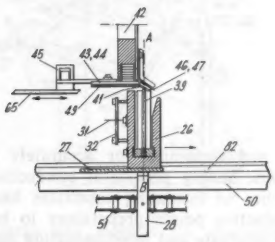
and in a generally transversally disposed position relative to the shear blades prior to the strand being sheared.

3,581,369

MANUFACTURE OF RELAY CONTACT STACKS

Lucien Ernest Grente, Boulogne, and Guy Etienne Gabriel Jardin, La Celle Saint-Cloud, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed July 9, 1969, Ser. No. 840,330
Claims priority, application France, July 19, 1968, 159,857
Int. Cl. H01r *43/00*
U.S. Cl. 29—203 **7 Claims**



Contact pile-up carriers are arranged on an endless belt. The pieces to be assembled in a pile-up are positioned in magazines above the belt and at right angles thereto. As the belt moves the carriers, the pieces are automatically deposited on the carriers. Each piece has at least one hole. Each carrier has pins, corresponding to the holes in the pieces, to hook pieces from the magazine and to center them in the stack. Each carrier has a movable base (which bears the pins). At the end of a cycle, this base is withdrawn sideways from the chain, together with the stack of pieces on the pins of the base.

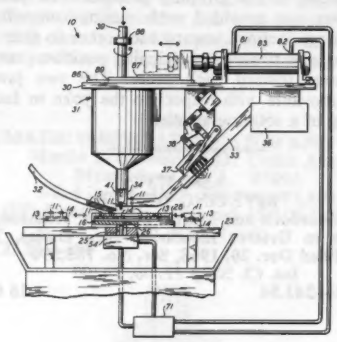
3,581,370

APPARATUS FOR CONTROLLING RELATIVE MOVEMENT BETWEEN A WORK TOOL AND A WORKPIECE

Daniel J. Passarella, Belleville, and Anthony J. Perrotta, North Haledon, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed May 28, 1969, Ser. No. 828,603
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 **13 Claims**

A workpiece having an array of openings is placed on a workholder to align the openings with a like array of bores in the workholder. The workholder is moved to position successively each of the openings in the workpiece in alignment with a work tool which is actuated to insert a part in each of the openings to a predetermined depth. When selected ones of the openings are aligned with the work tool, pins prepositioned in the corresponding bores



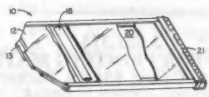
block a sensor orifice to energize a fluidic circuit and operate a device to limit the travel of the work tool to insert the part to a depth less than the predetermined depth.

3,581,371

PHOTOGRAPHIC FILM PACKET MANUFACTURE

Donald H. Bushey, Shrewsbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1969, Ser. No. 803,734
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 **15 Claims**



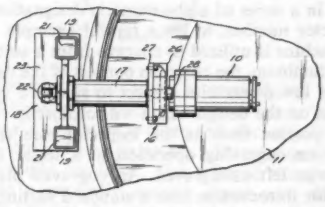
In photographic film packet manufacturing apparatus having stations operating on web portions, first and second detectors, downstream of first and second stations, providing signals to a memory in response to web portion conditions, an element responding to signals from the first detector to prevent operation of the second station, and an ejector following the second detector and responsive to signals from it to prevent web portions from reaching a terminal station.

3,581,372

AUTOMATIC WRENCH

Frank J. Fink, Chardon, Ohio, assignor to Imperial Manufacturing & Engineering Co., Middlefield, Ohio

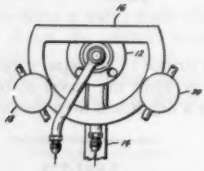
Filed Mar. 24, 1969, Ser. No. 809,810
Int. Cl. B25b *13/18*
U.S. Cl. 29—240 **10 Claims**



An automatic wrench mechanism is disclosed which is capable of automatically gripping an article formed with wrenching flats even when such article is rotating at the

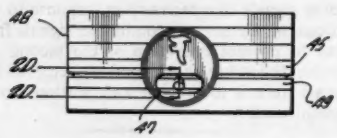
time gripping occurs. The mechanism includes a yoke pivotally supported on a frame and provided with two jaw members which are movable between an extended release position and a gripping position. The yoke and jaw members are provided with mating camming surfaces which are inclined toward each other so that movement of the jaws toward the gripping position causes the jaws to move toward each other. The two jaws are separately movable with respect to the yoke to facilitate the gripping of a rotating article.

3,581,373
RIVETING DEVICE
Henry W. Murdoch and Martin D. Hoza, Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Dec. 20, 1968, Ser. No. 785,590
Int. Cl. B23p *11/00, 19/00*
U.S. Cl. 29—243.54 **16 Claims**



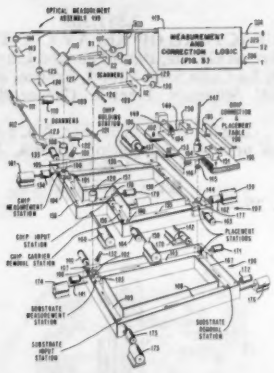
A riveting device including a yoke to extend around work pieces to be riveted, a pressure actuated clamp and a pressure actuated rivet former, the pressure actuated clamp and rivet former being secured to one side of said yoke and actuating against the other side of said yoke.

3,581,374
METHOD FOR PRINTING MATRIXES
Frederic S. Geary, 9364 S. Barkerville, Whittier, Calif. 90605
Filed Mar. 8, 1968, Ser. No. 711,663
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 **9 Claims**



A method and apparatus for producing a multi-element casting which, in composite form, yields an embossed outline useful in the preparation of flexible stamps is disclosed. The method and apparatus is particularly applicable to economically producing a plurality of inspector stamps wherein one particular portion of the design is repeated numerous times and another portion of the design is varied in a series of alpha-numeric designations such as an inspector number, to list a typical example. A pantograph machine is utilized to engrave from a soft material, such as aluminum, the common portion of the design at an unusually low depth with respect to standard type depth. The areas on the design which will ordinarily receive the variable portion such as the inspector numbers is outlined by an engraving operation at a lesser depth, but is otherwise left unengraved. An engraved plate is held in a jig for introduction into a standard casting machine. A cast slug is obtained from the machine which slug includes an embossed design of the portion common to the desired stamp, and further includes holes in the area where the variable portions of the stamp are to be located. The variable portions (i.e., inspector numbers) for the stamp are set up from ordinary print type and are cast in a separate casting operation. The casting for the common design portion has dimensions such that when it is "high-slugged" with the second lead casting of normal print type, a composite of the two completes the desired stamp design. The combined lead casting are placed into a chase and a matrix is formed from the chase. A normal vulcanizing process supplies a rubber inspector from the matrix.

3,581,375
METHOD AND APPARATUS FOR MANUFACTURING INTEGRATED CIRCUITS
Hans R. Rottmann, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 7, 1969, Ser. No. 805,264
Int. Cl. B23g *17/00;* **H05k** *13/04, 3/00*
U.S. Cl. 29—407 **7 Claims**



A method and apparatus for accurately positioning solid-state chips, having peripheral conductive pads, in retaining cavities of insulating substrates having corresponding conductive points preparatory to bonding the chips into the substrate and interconnecting the chip pads and substrate points to form "integrated circuits." The chip and a portion of the area surrounding the cavity of the substrate are optically scanned in a number of axes and an electrical output signal representative of the optically scanned points is supplied to logic which selects those electrical pulses which represent the substrate conductive points or terminals and chip pad center lines. Measurement counter logic is operated by the selected pulses to record counts corresponding to the selected scanned points. The recorded counts are used to position stepping motors to properly position the relative positions of the chip and a cavity of the substrate prior to placing the chip in the substrate cavity.

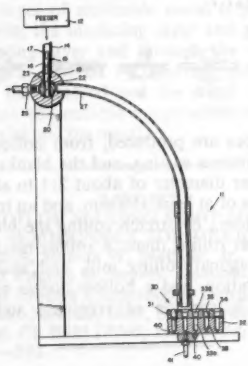
3,581,376
METHOD OF CONSTRUCTING A BENT LIGHT-CONDUCTING TUBE
Henry N. Pilling, Gladwyne, Pa., assignor to Pilling Co., Fort Washington, Pa.
Original application Sept. 20, 1966, Ser. No. 580,676, now Patent No. 3,496,931, dated Feb. 24, 1970. Divided and this application July 17, 1969, Ser. No. 842,656
Int. Cl. B23p *17/00*
U.S. Cl. 29—419 **2 Claims**

An illuminating endoscope is provided with light-conducting fibers contained in a tube having an oval cross-section. The oval tube is contained in an oval channel extending lengthwise along the wall of the endoscope bore, and is removable from the channel. The channel is

open throughout the part of its length where the bore diameter is minimum. To form the light-conducting tube, a circular portion is formed in a metal tube having an

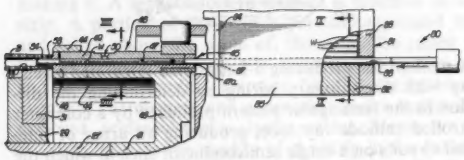
oval cross-section, and the circular portion is then bent at a right angle to avoid interference with the telescopic apparatus at the proximal end of the endoscope.

3,581,377
APPARATUS AND METHOD FOR SEPARATING CAPSULES
Hugh P. McKnight, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Apr. 25, 1969, Ser. No. 819,176
Int. Cl. B23p *19/02, 19/00*
U.S. Cl. 29—427 **15 Claims**



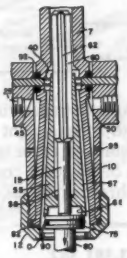
An apparatus and method for separating two-piece, hard-shell capsules in which a capsule is propelled at a high rate of speed through a chute until its trailing section is abruptly halted. Momentum of the leading piece of the capsule is such that it continues forward a distance sufficient to permit complete separation of the two-piece capsule sections.

3,581,378
METHOD AND APPARATUS FOR ASSEMBLING A POROUS POINT PEN
Victor Jozens, Venice, Calif., assignor to The Gillette Company, Boston, Mass.
Filed Mar. 3, 1969, Ser. No. 803,545
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—429 **7 Claims**



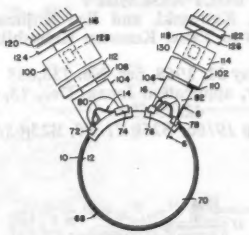
A porous point pen assembly apparatus and method for rapidly and automatically assembling a pen; the apparatus includes a rotatable index drum for supporting pen barrels, a second drum for supporting porous wicks or reservoirs in split bushing so as to accommodate wicks of varying diameter, means for supplying ink to each wick so as to provide complete saturation thereof, and means for inserting the wick into the drum, supplying a tip to the pen barrel, staking the tip to the pen barrel, and performing these assembly operations in timed sequence so as to produce a partially assembly porous point pen.

3,581,379
PNEUMATIC O-RING APPLICATOR AND METHOD
Martin E. Drobilits, 1827 Cedar Ave., Mountainside, N.J. 07092
Filed Dec. 5, 1967, Ser. No. 691,681
(Filed under Rule 47(b) and 35 U.S.C. 118)
Int. Cl. B23p *11/02*
U.S. Cl. 29—450 **10 Claims**



A device adapted for semi or full automatic operation for the positioning of O or retaining rings upon grooved shafts, pins and the like, wherein the said rings are fed to a reciprocating shuttle which successively feeds the same over a conical, continuously expanding passageway, and pneumatic pressure applied through said passageway causes the rings to expand to the required distance to snap into the grooves of the receiving objects, the latter being sequentially fed in timed sequence to the largest and egress end of the passageway.

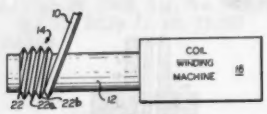
3,581,380
METHOD FOR MAKING TRANSMISSION BANDS
Frederic W. Talbot, Waterford, Mich., assignor to Detroit Aluminum & Brass Corporation, Detroit, Mich.
Filed Sept. 30, 1968, Ser. No. 763,815
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.3 **14 Claims**



A method of manufacturing a transmission band for an automatic vehicle transmission is provided. The transmission band includes an arcuate metallic strip lined with a frictional strip. These strips are adhered together while in a flat, straight condition. The adhered strips are then formed into a generally arcuate shape with the lining strip on the interior. Brackets are then provided on each free end of the metallic strip. The brackets are preferably welded to the metallic strips. In the welding step, the brackets, which have projections thereon, are placed

against the outer surface of the metallic strip with the projections in contact therewith. A welding electrode is then placed in pressure contact with the brackets and an electrical current is applied through the electrode, projections and metallic strip while the pressure is maintained to weld the projections to the metallic strip.

3,581,381
METHOD OF FORMING A THREADED TUBE
Walter Freeman, 155 W. 68th St., Apt. 230, New York, N.Y. 10023
Filed Apr. 10, 1968, Ser. No. 720,216
Int. Cl. B23k *31/02*
U.S. Cl. 29—477.3 **7 Claims**

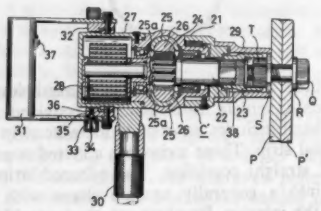


The method of forming a threaded tube wherein a wire is wound on a mandrel to form a tight helix, the helically wound wire is then removed from the mandrel and is heated to cause a fusing of adjacent convolutions, whereby to form an integral threaded tube.

3,581,382
DIFFUSION BRAZING OF ALUMINUM AND ALUMINUM BASE ALLOYS
Robert R. Wells, La Mirada, Bobby J. Mays, Redondo Beach, and Terry A. Krinke, Manhattan Beach, Calif., assignors to Northrop Corporation, Beverly Hills, Calif.
No Drawing. Filed Oct. 7, 1968, Ser. No. 765,678
Int. Cl. B23k *31/02, 35/24*
U.S. Cl. 29—498 **9 Claims**

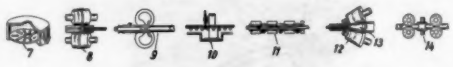
A self-fluxing method for joining two surfaces of aluminum and aluminum base alloys comprising coating one of the mating surfaces with a thin layer of copper, then placing a thin layer of tin over the copper, placing the two pieces to be joined together and heating to at least the eutectic temperature for a ternary aluminum-copper-tin alloy system. The maximum temperature of heating can be lowered by the addition of a small amount of silver which is coated on the copper before the tin layer is placed thereon.

3,581,383
METHOD FOR TIGHTENING A NUT AND BOLT ASSEMBLY
Kenichi Tadahira, Kawasaki, and Jiro Kojima, Tokyo, Japan, assignors to Taisei Kensetsu Kabushiki Kaisha, Tokyo, Japan
Filed May 31, 1968, Ser. No. 733,655
Claims priority, application Japan, Dec. 13, 1967, 42/79,550
Int. Cl. B23p *19/06;* **B25b** *21/00;* **B23g** *3/16*
U.S. Cl. 29—526 **1 Claim**



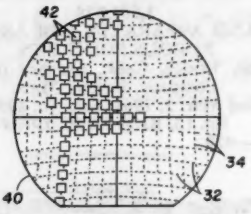
An improved method for tightening a nut and bolt assembly fitting a washer and a nut to a threaded end portion of a bolt inserted through bores in members to be clamped together to cause the washer to be pressed against the surface of the member to be clamped. Then the extremal end of a rotary rod which is adapted to be rotated by hydraulic pressure, and the extremal end of a cylinder concentrically in the bolt surrounding said rotary rod are engaged with said nut and washer, respectively. Hydraulic pressure is applied to rotate the rotary rod, thereby applying a torque to and rotating the nut simultaneously, the washer is prevented from rotating, and the point of engagement between the washer and the cylinder absorb the reaction force created. When a predetermined torque is reached, the hydraulic pressure is automatically terminated.

3,581,384
METHOD OF PRODUCING SEAMLESS METAL TUBES
Ulrich Petersen, Dusseldorf, and Friedrich-Hans Grandin and José Severin, Mulheim (Ruhr), Germany, assignors to Mannesmann A.G., Dusseldorf, Germany
Filed June 25, 1968, Ser. No. 742,475
Claims priority, application Germany, June 28, 1967, P 15 58 276.0; Mar. 30, 1968, P 17 52 078.4; Apr. 5, 1968, P 17 52 116.3
Int. Cl. B23k *19/00;* **B23p** *17/00, 25/00*
U.S. Cl. 29—527.7 **7 Claims**



Seamless tubes are produced, from hollow blanks obtained by continuous casting, and the blanks have a ratio of outer to inner diameter of about 2:1 to about 5:1 and a wall thickness of at least 150 mm. and an inner diameter of at least 80 mm., by stretch rolling the blanks, heating them and further rolling them. A rolling machine includes a three-roll diagonal rolling mill, and each roll has a shoulder calibration, and a hollow nozzle carrying mandrel rod that is capable of receiving and spraying a pressure water.

3,581,385
METHOD FOR FABRICATING LARGE SCALE INTEGRATED CIRCUITS WITH DISCRETIONARY WIRING
Jay W. Lathrop, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 4, 1967, Ser. No. 672,851
Int. Cl. B01j *17/00;* **H01l** *7/00*
U.S. Cl. 29—574 **6 Claims**



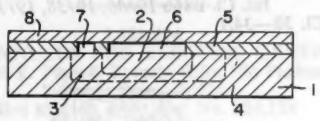
A method for producing a large scale integrated circuit array with discretionary wiring by determining the distortion in the rectangular pattern produced by a computer controlled cathode ray tube, producing an array of integrated circuits on a single semiconductor slice in which the circuits are disposed in a correspondingly distorted pattern, testing the circuits in situ to determine the operative circuits, producing a photomask by means of the cathode ray tube, defining the wiring needed to interconnect the operative circuits into the desired system, and patterning a metal film by means of the photomask.

3,581,386

METHODS OF MANUFACTURING SEMI-CONDUCTOR DEVICES

John Robert Dale, Brighton, and Michael John Josh, Reigate, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 3, 1968, Ser. No. 742,380
Claims priority, application Great Britain, July 7, 1967, 31,353/67
Int. Cl. B01j *17/00;* H01l *7/24*
U.S. Cl. 29—590 15 Claims



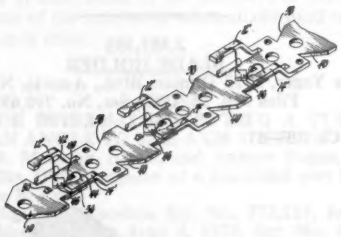
A method for providing electrically conductive connections to a semi-conductive device comprising a body semi-conductive material having an apertured insulating layer covering at least a portion of the surface of the material. A layer of malleable metal is placed over and in contact with the insulating layer and pressure welded to the insulating layer and through the aperture to the semi-conductive material by applying pressure and heat which heats the material and the metal layer to a temperature below the eutectic temperature of the semi-conductive material and the metal.

3,581,387

METHOD OF MAKING STRIP MOUNTED SEMICONDUCTOR DEVICE

Robert E. Buck, Robert W. Metzger, Jr., Albert D. Rittmann, and Eugene H. Sayers, Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1967, Ser. No. 686,589
Int. Cl. B01j *17/00;* H01l *1/14, 5/02*
U.S. Cl. 29—591 9 Claims



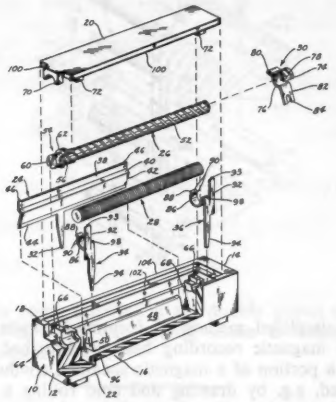
A semiconductor package assembly and method of making it. A semiconductive element is mounted on a flat strip. A portion of the strip is partially separated from, and raised above the plane of, the strip. The raised portion is eventually completely separated from the strip, and forms a terminal member for the semiconductive element. The element and connection to the terminal are enclosed, preferably in a plastic potting. Means are provided to increase the rigidity of the strip in the enclosure area. Means are also provided to enhance adhesion of a plastic potting to the strip and terminal members. A plurality of devices can be simultaneously or successively formed from a single strip. Multiple terminal devices can be formed using adjacent multiple raised portions on the strip.

3,581,388

METHOD OF ASSEMBLING A POTENTIOMETER

Robert F. Klug and Larry B. Lindquist, Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

Original application Nov. 4, 1966, Ser. No. 592,077, now Patent No. 3,476,120. Divided and this application Feb. 5, 1968, Ser. No. 703,040
Int. Cl. H01s *4/00*
U.S. Cl. 29—592 3 Claims



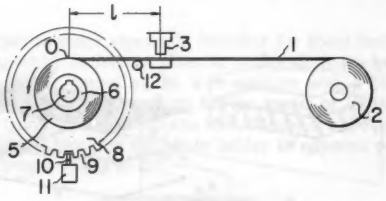
The method of assembling a potentiometer having a resistance coil, a collector member and a wiper assembly by providing a housing having an opening in one side, placing a closure having a tapered rib adjacent its peripheral edge within said opening, applying pressure and ultrasonic vibrations to the closure and the housing to concentrate heat energy at the rib to melt the rib, and cooling of the resulting unit to effect the seal of the closure to the housing unit.

3,581,389

FABRICATION OF MAGNETIC CORES FOR ELECTRIC ROTATING MACHINES HAVING AXIALLY-SPACED AIR GAPS

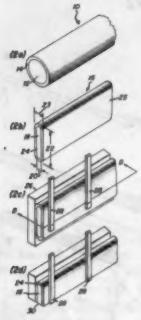
Tetsuro Mori, Kazuo Karino, and Nobuo Matsui, Kitakyushu-shi, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Oaza-Fujita, Yahata-ku, Kitakyushu-shi, Fukuoka-ken, Japan

Filed Sept. 18 ,1968, Ser. No. 760,651
Int. Cl. H02k *15/02*
U.S. Cl. 29—598 7 Claims



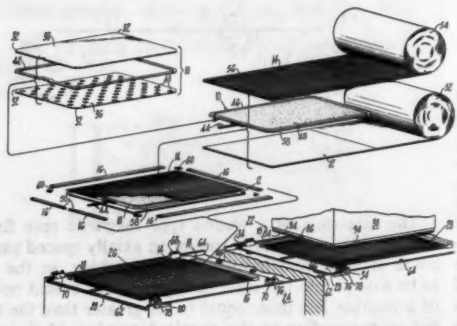
The side slots of a wound type magnetic core for an electric rotating machine having an axially spaced gap are made radially rectilinear by first punching, in the strip to be wound into the core, slot openings or cutout notches of a number less than, equal to, or greater than the number corresponding to the required number of slots, and after completion of the core winding, the winding turns of the core are decreased or increased to obtain the required number of slots.

3,581,390
METHOD OF FORMING SINGLE TURN MAGNETIC RECORDING HEADS
Donald S. Rodbell, Tokyo, Japan, assignor to General Electric Company
Filed Feb. 10, 1969, Ser. No. 797,887
Int. Cl. H01f *7/06*
U.S. Cl. 29—603 **7 Claims**



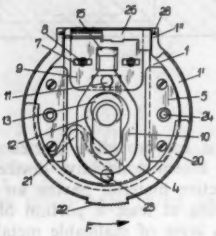
A simplified method of forming a single turn read/write magnetic recording head is described wherein at least a portion of a magnetic sheathed conductor is compressed, e.g. by drawing and cold rolling a nickel-iron-cobalt coated copper wire, to form a laminar ribbon having a center conductor equal in thickness to the desired recording head gap. After mounting the laminar ribbon upon a suitable heat sink, the ribbon is dissected along a plane perpendicular to the plane of the ribbon to expose the recording surface of the head. When only a central section of a bifurcated shaped magnetic coated conductor is compressed to a laminar ribbon and dissected, a single turn recording head having inherently attached heads is formed. For simultaneous recording on adjacent tracks with a minimum of crosstalk, a multihead structure is formed by bonding conductive leads along opposite faces of a unitary homogeneous compressed laminar ribbon prior to dissection of the ribbon to expose the recording surfaces.

3,581,391
METHOD OF MANUFACTURING A HERMETICALLY SEALED MAT SWITCH
Paul V. Shaver, Wallingford, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Oct. 7, 1968, Ser. No. 765,347
Int. Cl. H01h *11/00*
U.S. Cl. 29—622 **7 Claims**



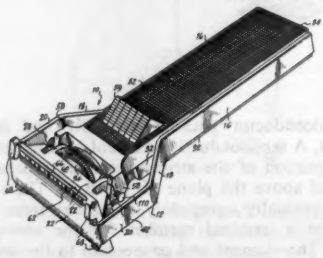
An electrical mat switch comprises a fully sensitive contact plate subassembly hermetically enclosed by preformed base and cover layers which extend outwardly beyond the periphery of the subassembly and portions of accurately dimensioned locator strips which abut the edges of the subassembly and facilitate the peripheral heat sealing enclosure thereof.

3,581,392
SHAVER AND LONG HAIR TRIMMER
Otto Hubner, 33 Gruntal, 8 Munich, Germany
Filed May 24, 1968, Ser. No. 731,851
Claims priority, application Germany, May 29, 1967, P 15 53 718.5
Int. Cl. B26b *19/06, 19/38, 19/10*
U.S. Cl. 30—34.1 **10 Claims**



A shaver comprises a housing, a motor in the housing and having a rotatable drive shaft, a shaving head that can be coupled with the drive shaft, and a trimmer device for trimming sideburns and long hair. The trimmer device includes a first toothed blade and a second toothed blade mounted on the first blade for oscillatory movement relative thereto. Mounting means mounts both blades for movement as a unit transversely of the drive shaft between an inoperative and an operative position. Coupling means couples the second toothed blade with the drive shaft for oscillation by the latter and includes a coupling member a first portion of which engages the second blade and a second portion of which engages the drive shaft when the blades move as a unit to their operative position.

3,581,393
BLADE HOLDER
Victor Yager, 2712 Ditmars Blvd., Astoria, N.Y. 11105
Filed Jan. 13, 1969, Ser. No. 790,692
Int. Cl. B26b *21/14, 1/00*
U.S. Cl. 30—61 **7 Claims**



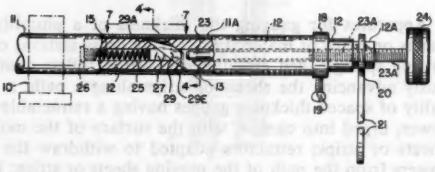
A safety razor or razor blade holder wherein there is no protruding portions of the supported blade. The main component parts of the razor or holder are manufactured of simple metal or plastic castings or a combination of both to suit the requirements for utility and sales appeal. The razor or holder has a flat handle which affords the

user a constant awareness of the cutting side by association with the flat side held by the fingers of the user. The razor or holder comprises a frame, a sectional plastic handle on the frame, one section being stationary and the other slidable. A head assembly for supporting a razor blade is pivotally connected to the end of the slidable handle section. Coiled springs are mounted on the head assembly and slidable handle for retracting the head assembly. Wheel actuated indexing means is provided for adjusting the size of the space for clampingly supporting a razor blade. The slidable handle section is spring loaded.

3,581,394
ROTOR ANNULUS FOR ELECTRIC GENERATOR
Russell E. Phelon, Beverly Hills, Rio Piedras, Puerto Rico 00928
Filed May 13, 1969, Ser. No. 824,138
Int. Cl. H02k *21/12*
U.S. Cl. 310—156 **4 Claims**

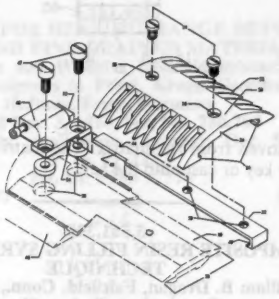
A rotor annulus for an electric generator comprising an annular ring of magnetic members including permanent magnets and pole pieces arranged in respective end-to-end and circumaxial alternate series. A circular spring band surrounds the ring of members in pressing engagement with at least some of the members to hold all of the elements of the annulus in substantially fixed relationship with each other.

3,581,395
TOOL FOR INTERNALLY CUTTING A TUBE AT AN ANGLE TO THE AXIS THEREOF
Thomas B. McGuire, Elyria, and Andrew Pogan, North Ridgeville, Ohio, assignors of a fractional part interest to Bruce B. Krost
Continuation of application Ser. No. 375,217, June 15, 1964. This application June 4, 1970, Ser. No. 43,348
Int. Cl. B23d *21/06, 27/00*
U.S. Cl. 30—107 **7 Claims**



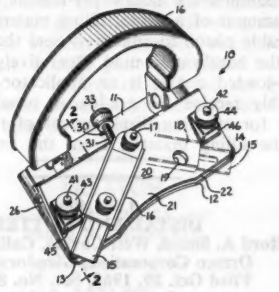
A cutting tool for internally cutting a tube at a distance from an end thereof. The blade may be so arranged within said tube during the cutting operation that a beveled end is obtained.

3,581,396
COMB ATTACHMENT FOR ELECTRIC SHEARS
Staffas Broussard, Sr., 2110 St. Bernard Ave., New Orleans, La. 70119
Filed June 12, 1969, Ser. No. 832,735
Int. Cl. B26b *19/38*
U.S. Cl. 30—201 **6 Claims**



A double comb attachment for double action electric hair shears in which the cutting action is longitudinal rather than transverse.

3,581,397
TRIMMER FOR FOAM-BACKED CARPETING OR THE LIKE
George A. Kochanowski, Chicago, Ill., assignor to Kinkead Industries Incorporated, Chicago, Ill.
Filed May 16, 1969, Ser. No. 825,246
Int. Cl. B26b *29/00*
U.S. Cl. 30—293 **7 Claims**

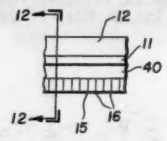


A carpet trimmer especially intended for foam-backed carpeting which includes a plate for riding along the bent-up edge of the carpet at the wall position with a blade mounted thereon for trimming off the excess or scrap so that the trimmed edge abuts the wall. Means are provided for positively blocking the blade holder in adjusted position for proper height of cut.

3,581,398
DENTAL KEYING DEVICE
John M. Thomas, Webster, N.Y., assignor to Thomas Technadent Products, Inc., Rochester, N.Y.
Continuation-in-part of application Ser. No. 696,301, Jan. 8, 1968. This application Dec. 9, 1968, Ser. No. 784,539
Int. Cl. A61c *13/00*
U.S. Cl. 32—11 **23 Claims**

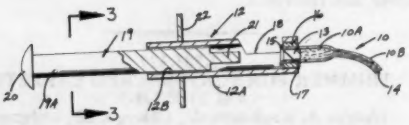
A dental model is cast on an arch-shaped ridge that has a key extending beyond the base of the model. The key has

vertical corrugated walls that fit closely into a matrix so that the kewed model can be cut up and its parts inserted



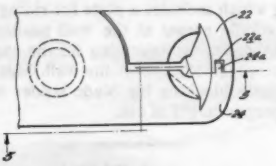
and removed from the matrix. The matrix is either made to fit the key or cast onto the key.

3,581,399
COMPOSITE RESIN FILLING SYRINGE AND TECHNIQUE
William B. Dragan, Fairfield, Conn., assignor to Centrix, Inc., Easton, Conn.
Filed Aug. 8, 1969, Ser. No. 848,421
Int. Cl. A61c *5/04*
U.S. Cl. 32—60 **10 Claims**



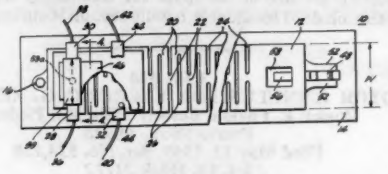
This disclosure is directed to a dental material carrier and an applicator gun therefor. The dental material carrier comprises a nozzle pre-loaded with a predetermined amount of a dental filling material and having a displaceable piston to effectively seal the dental material within the nozzle until used. Operatively associated with the pre-loaded nozzle is an applicator gun adapted to detachably receive the pre-loaded nozzle and having a plunger for effecting displacement of the piston to extrude the filling material from the carrier as desired.

3,581,400
DISTAL END CUTTER
Wilford A. Snead, West Covina, Calif., assignor to Ormco Corporation, Glendora, Calif.
Filed Oct. 29, 1969, Ser. No. 875,616
Int. Cl. A61c *7/00*
U.S. Cl. 32—66 **4 Claims**



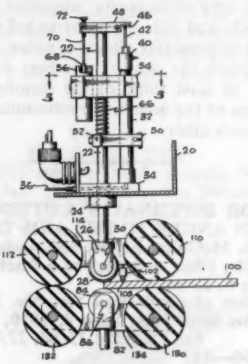
An improved orthodontic pincer-type tool is provided for cutting the end from an arch wire within the mouth of the patient distally of the buccal tube. The tool is constructed so as to be easily manipulated to cut the distal ends off the arch wire, without any tendency for the cut-off ends to be projected forcibly into the gum or cheek tissue of the patient.

3,581,401
RULING ENGINE AND CARRIAGE INDEXING MECHANISM THEREFOR
Leon S. Yaggy, Oceanside, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Feb. 3, 1969, Ser. No. 795,789
Int. Cl. B43l *13/24*
U.S. Cl. 33—19 **29 Claims**



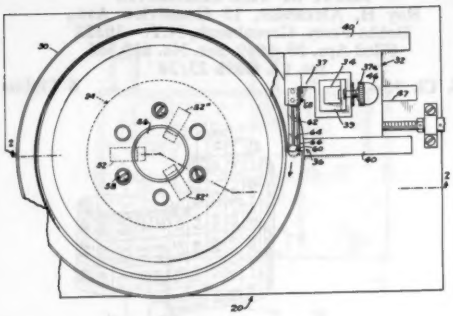
A ruling engine incorporating a scribing mechanism and a carriage indexing mechanism. A stretch plate, carriage, and clamping devices are arranged so that the carriage may be indexed between scribing operations by selective clamping and declamping of portions of the carriage to the stretch plate during alternate stretching and relaxing of the stretch plate.

3,581,402
AUTOMATIC THICKNESS GAUGING APPARATUS
Norman I. London, 13524 Lull St., Van Nuys, Calif. 91402, and Alan R. Davis, 3103 S. Coolidge Ave., Los Angeles, Calif. 90066
Filed Mar. 26, 1969, Ser. No. 810,559
Int. Cl. A61b *5/10*
U.S. Cl. 33—174 **8 Claims**



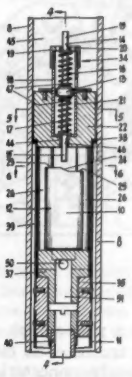
Apparatus for gauging the thickness of a plurality of sheets or strips of material of varying cross-sections comprising springloaded articulated powered rollers continuously advancing the sheets or strips along a path; a plurality of spaced thickness gauges having a retractable follower, urged into contact with the surface of the moving sheets or strips; retractors adapted to withdraw the followers from the path of the moving sheets or strips; limit switches actuated by the passage of the trailing edge of each sheet or strip to activate said retractors, and by the passage of the leading edge of the following sheet or strip to deactivate said retractors; and braking means controlling the rate of movement of the followers.

3,581,403
WHEEL RIM RUNOUT MEASURING APPARATUS
Elvin E. Tuttle, Lansing, Mich., assignor to Motor Wheel Corporation
Filed Sept. 12, 1968, Ser. No. 759,317
Int. Cl. G01b *13/18*
U.S. Cl. 33—203.16 **8 Claims**



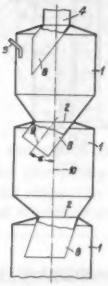
A machine for sensing the runout of the bead seat of an automotive vehicle wheel rim by probing the contoured inside corner surfaces of the tire bead retaining and supporting portion of the wheel rim while it is being rotated. The sensing device comprises a probe yieldably urged into engagement with said surfaces of the wheel rim by a spring steel wire on which a sliding ball contactor of the probe is mounted. Two strain gaged cantilever leaf springs are positioned so that they continuously slidably engage the ball near their free ends, the leaves being disposed with their wider flat sides transverse to each other so as to lie respectively in planes paralled and perpendicular to the axis of rotation of the wheel rim. The leaves serve as deflection responsive electrical transducers, one leaf being responsive only to radial runout and the other leaf only to lateral runout.

3,581,404
WEDGE ORIENTATION DEVICE
Ronald Thomas Sanfead, Kalgoorlie, Western Australia, Australia, assignor to Western Mining Corporation Limited, Melbourne, Victoria, Australia
Filed May 6, 1968, Ser. No. 726,750
Int. Cl. E21b *47/02;* **G01c** *9/00*
U.S. Cl. 33—205 **11 Claims**



A drill line wedge orientation device having a direction sensitive member and a member movable by pressure in the drill line. The direction sensitive member is so arranged that when the device has a predetermined orientation relative to vertical, the movable member is free to move in response to the pressure in the drill line and result in a changed parameter which can be monitored at the head of the drill line. The changed parameter can be either a drop in pressure or an increase in the fluid flow.

3,581,405
APPARATUS FOR HEAT EXCHANGE BETWEEN A GAS AND FINE-GRAINED MATERIAL
Werner Dercks and Wilhelm Hohenhinnebusch, Essen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Dec. 3, 1968, Ser. No. 780,703
Claims priority, application Germany, Dec. 5, 1967, P 16 01 125.9
Int. Cl. F26b *17/14*
U.S. Cl. 34—57 **5 Claims**

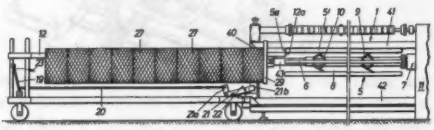


Apparatus for effecting a heat exchange between a gas and fine-grained material. The apparatus is comprised of a number of processing chambers arranged one on top of the other and having openings between them which provide communication between successive chambers. The apparatus also includes at least one material inlet arranged to insert material in the uppermost chamber and at least one gas outlet tube forming an opening at the top of the uppermost chamber. According to the present invention, a baffle plate is attached to the edge of the opening at the top of each of the processing chambers to project inward into the associated chamber and guide the flow of material and gas.

ERRATUM

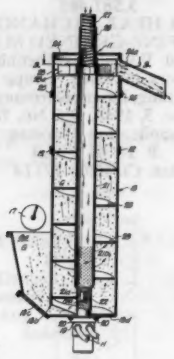
For Class 34—115 see:
Patent No. 3,581,411

3,581,406
DEVICE FOR TAKING OFF STRANDS WOUND UP ON A REELING MACHINE AND SUBSEQUENTLY DAMPENING IN A DAMPENING MACHINE
Ernst Lucke, Stuttgart-Degerloch, Germany, assignor to Croon & Lucke, Mengen, Wurttemberg, Germany
Filed Dec. 5, 1969, Ser. No. 882,516
Claims priority, application Germany, Aug. 25, 1969, P 19 43 106.2
Int. Cl. F26b *13/00*
U.S. Cl. 34—153 **10 Claims**



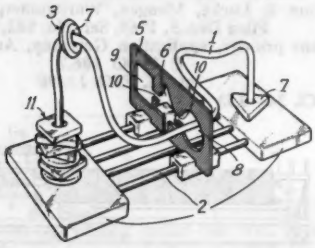
A device for taking off strands wound up on a reeling machine into a steaming machine and then removing the strands after the steam treatment which contains a device that strips the strands off a reeling basket.

3,581,407
GRAIN CONDITIONER
Horace R. Ward, R.R. 2, Windsor, Mo. 65360, and Kenneth A. Wirtz, R.R. 1, Garden City, Mo. 64747
Filed Jan. 25, 1968, Ser. No. 707,348
Int. Cl. F26b *11/12*
U.S. Cl. 34—182 6 Claims



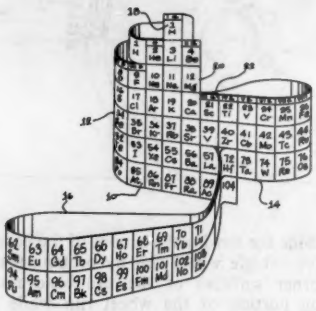
An apparatus for conditioning grain while in the grain tank of a combine or similarly related grain harvesting equipment. The apparatus includes a main housing in the shape of a cylindrical chamber, same being mounted within the grain tank in an optical position to receive the grain therewithin as it is delievered into the tank. A centrally mounted auger with a tubular center shaft is axially located within the chamber. The shaft is coupled with the combine engine exhaust by a flexible hose in such a manner that the hot exhaust gases heat the auger as well as co-mingle with the grain within the chamber. A gravity discharge chute at the upper end portion of the chamber allows the upwardly conveyed and now conditioned grain to spill out and back into the tank.

3,581,408
MANUAL DEXTERITY MEASURING AND TRAINING DEVICE
Jacques Emile Mohier, Rue de la Garenne, Croth par Sorel-Moussel 28, France
Filed Feb. 4, 1969, Ser. No. 796,487
Claims priority, application France, Feb. 5, 1968, 138,634
Int. Cl. G09b *19/00*
U.S. Cl. 35—22 7 Claims



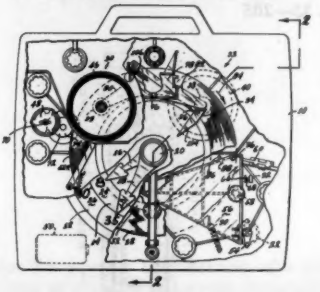
A manual dexterity measuring and training device having a semi-rigid rod forming a path which may be changed. On the rod are slidably mounted annular objects which may be moved by hand or otherwise. Also included in the invention is a plate which may move relative to the rod and annular objects.

3,581,409
THREE DIMENSIONAL SYMBOLIC ARRANGEMENT OF THE ELEMENTS
Roy H. Alexander, 15 Grandview Ave., Dobbs Ferry, Greenburgh, N.Y. 10522
Filed Apr. 25, 1969, Ser. No. 819,366
Int. Cl. G09b *23/24*
U.S. Cl. 35—18 6 Claims



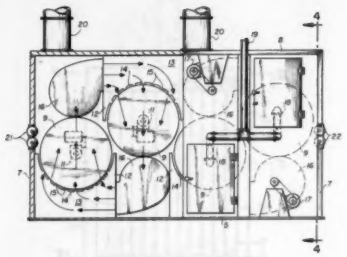
A three dimensional symbolic representation of the elements with fully grouped families including the Rare Earth series is presented in which the symbolic representations of the elements are arranged contiguously and continuously according to atomic number.

3,581,410
TALKING CLOCK
Willard L. Zeigner, Fountain Valley, Andrew M. Holland, Venice, and Donald J. Maurer, Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 25, 1969, Ser. No. 802,064
Int. Cl. G09b *19/12*
U.S. Cl. 35—39 4 Claims



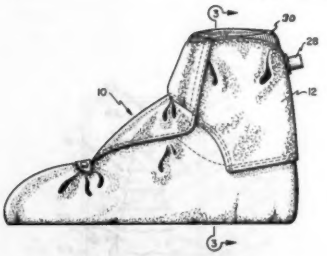
A toy clock with a phonograph which states the time at which the hands are set. The clock includes a record with twenty-four nearly concentric grooves, twelve of them defining the hour and twelve defining the closest five minute interval after the hour. Two tone arms are provided, one engaging an hour groove and the other a minute groove, and the hour and minute sayings are played in succession.

3,581,411
CYCLE-AIR PERVIOUS DRUM-TYPE DRIER
Frank Catallo, 187 Wellington Ave., Elmont, N.Y.
Filed Mar. 6, 1969, Ser. No. 804,745
Int. Cl. F26b *11/02*
U.S. Cl. 34—115 6 Claims



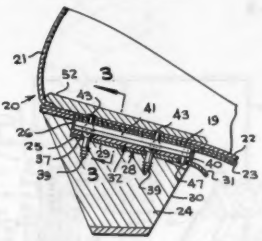
This invention is directed to an enclosed drum dryer for textile webs that includes a plurality of air-pervious dryer drums alternately arranged in offset upper and lower banks. The outer surface of each drum receives heated air through high velocity nozzle slots in an associated pressure chamber that is connected to a pair of fans. The enclosure is maintained under negative pressure by an exhaust fan. Each offset pair of dryer drums in effect has its own air circulation system.

3,581,412
INNER BOOT AND METHOD FOR FORMING THE SAME
Melvin W. Dalebout, 3661 Ceres Drive, Salt Lake City, Utah
Continuation-in-part of application Ser. No. 726,094, May 2, 1968, now Patent No. 3,521,385. This application Feb. 4, 1971, Ser. No. 8,547
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5AL 28 Claims



An inner boot which includes an outer liner, an inner liner connected to the outer liner and spaced apart therefrom to form a sealed compartment between the liners, and a resilient member positioned between the liners to mold the inner liner to the shape of an individual's foot and the outer liner to the interior shape of an outer boot shell. The resilient member is formed by injecting a liquid resin elastomer reaction mixture under pressure into the compartment between the liners when an individual's foot is positioned within the inner liner and when the inner boot is fitted in the outer boot shell and thereafter curing the resin elastomer reaction mixture.

3,581,413
DETACHABLE HEEL
Harvey Simonetti, 635 Princeton Place N.W., Washington, D.C. 20010
Filed Dec. 18, 1969, Ser. No. 886,086
Int. Cl. A43b *21/39*
U.S. Cl. 36—42 5 Claims

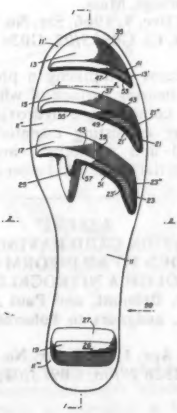


A detachable heel for shoes such as ladies' or men's shoes that includes a means for permitting the manual locking or unlocking of the heel with respect to the shoes, so that heels can be placed or changed whenever desired or required.

ERRATUM

For Class 36—2.5 see:
Patent No. 3,581,412

3,581,414
ATHLETIC SHOE'S SAFETY TRACTION-SOLE CLEATS
Frank J. Crawford, 2539 Union Ave., Memphis, Tenn.
Filed June 18, 1969, Ser. No. 842,423
Int. Cl. A43c *15/00*
U.S. Cl. 36—59R 9 Claims

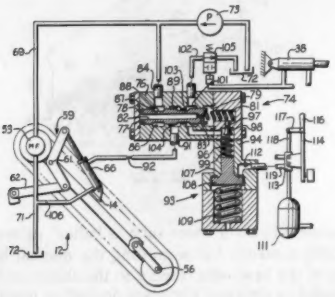


Safety traction sole cleats for an athletic shoe. There are four cleats fixedly attached to the sole, namely, a toe cleat, a front ball cleat, a rear ball cleat, and a heel cleat. The toe, front ball and rear ball cleats have sloped forward surfaces, flat lower surfaces and rearward surfaces substantially perpendicular to the lower surfaces, and the heel cleat has a flat lower surface and surfaces around the lower surface sloping upwardly to the sole. There are cut-cleat portions extending rearwardly from said front and rear ball cleats.

3,581,415
AUTOMATIC POSITIONING SYSTEMS FOR SCRAPER ELEVATORS

Trevor G. Campbell; Robert V. Larson; Sebald K. Stahl, Peoria; Richard K Liess, and Roger A. Rice, Joliet, all of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of application Ser. No. 656,559, July 27, 1967, now abandoned. This application Aug. 28, 1969, Ser. No. 852,999
Int. Cl. B60p 1/36
U.S. Cl. 37—8 6 Claims



The elevator of a self-loading earth-moving scraper is moveable as a unit relative to the bowl thereof and automatic controls are provided which shift the elevator at predetermined stages in the operating cycle of the scraper. The automatic controls operate by sensing forces which react on other components of the scraper and which are indicative of the need for shifting the elevator. The elevator may, for example, pivot gradually upward as loading progresses or may be raised substantially prior to load ejection without requiring control of these movements by the operator.

3,581,416
TAMPER PROOF LAMINATIONS HAVING SILVER IMAGE

Paul A. Andrews, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

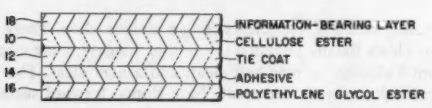
Filed Dec. 9, 1966, Ser. No. 600,577
Int. Cl. G09f 3/02; G03c 11/08
U.S. Cl. 40/2.2 8 Claims

Laminar structures comprising a photographic image in silver, the image-bearing surface of which is laminated to a transparent layer comprising a hydroxylated polymer via an intermediate layer consisting essentially of a mixture of polyvinyl alcohol and a methyl vinyl ether-maleic acid copolymer or a partial lower alkyl ester of such a copolymer.

3,581,417
AN IDENTIFICATION CARD HAVING A TRANSPARENT LAYER BONDED TO AN INFORMATION BEARING SURFACE THROUGH A NITROCELLULOSE TIE-COAT

Paul A. Andrews, Belmont, and Paul A. Plasse, Lexington, both of, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 1, 1968, Ser. No. 717,709
Int. Cl. B32b 27/06; C09f 3/02; B23b 27/36
U.S. Cl. 40—2.2 11 Claims

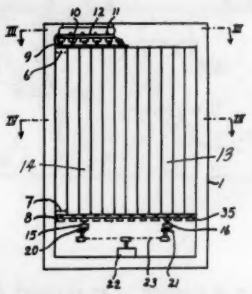


Novel products comprising an adhesive coated polyester film laminated to a cellulose ester through a "tie-coat" consisting essentially of plasticized nitrocellulose.

3,581,418
DEVICE FOR ADVERTISEMENTS OR OTHER INDICATIONS, ESPECIALLY A SIGN BOARD

Harry Tryssing, Alvsjo, Sweden, assignor to Ingenjorsfirma Delta AB, Segeltorp, Sweden

Filed Sept. 11, 1968, Ser. No. 759,150
Int. Cl. G09f 11/02
U.S. Cl. 40—77.7 4 Claims

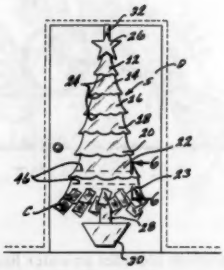


An advertising sign board with indicia that changes at regular intervals. The display surface of the sign is formed by a plurality of elements arranged side by side at the front of a supporting frame. Another row of elements is provided at the rear side of the frame. A separate wide endless ribbon is mounted on each element in the front row and on a corresponding element in the rear row. Each of the ribbons is advanced simultaneously from one display section to another by rotation of the elements in the front and rear rows.

3,581,419
A DECORATIVE DOOR-HUNG TREE STRUCTURE FOR HOLDING GREETING CARDS

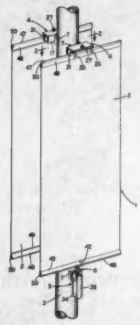
Robert S. McCracken, Pasadena, Calif., assignor to Beagle Manufacturing Company

Filed Jan. 31, 1969, Ser. No. 795,542
Int. Cl. G09f 1/10
U.S. Cl. 40—124 4 Claims



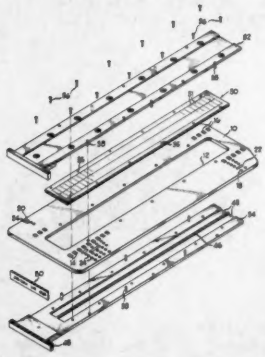
A decorative door-hung tree structure is disclosed to be made of foam plastic, as for holding greeting cards or to support decorative accessories. A set of skirt member of progressively varying size are affixed together in lapped relationship by bristled fasteners which extend through adjacent skirt sections. A top decoration and base are similarly affixed to complete an assembly which is secured to a ribbon, useful for suspending the entire unit on a door.

3,581,420
POLE SIGN CONSTRUCTION
Samuel J. Mollet, III, Canton, and Thomas Friedrichsen, Massillon, both of, Ohio, assignors to The Massillon-Cleveland-Akron Sign Company, Massillon, Ohio
Filed May 29, 1969, Ser. No. 828,848
Int. Cl. G09f 15/02
U.S. Cl. 40—125 10 Claims



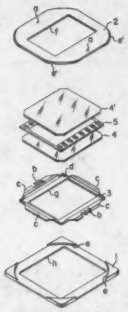
The pole banner sign construction has permanent hardware for supporting a flexible banner on a pole. All of the hardware excepting a simple mounting plate is removable from the pole for storage so that it does not present an unsightly appearance when not used for supporting a banner. A simple flexible banner that may be changed from time to time is mounted on the hardware and is adapted to be folded into a small package for shipment in an envelope. A pair of banner members may be similarly mounted on either side of the pole. The banner may be changed from time to time without the use of any tools by merely unhooking several hooks from banner engagement, and transferring pull rods from an initial banner to a replacement banner, and then hooking the replacement banner in place.

3,581,421
CODED VISUAL INFORMATION STORAGE UNIT
William J. Raymond, Des Plaines, Ill., assignor to Berg-Warner Corporation, Chicago, Ill.
Filed Feb. 6, 1969, Ser. No. 797,117
Int. Cl. G09f 11/00
U.S. Cl. 40—152 2 Claims



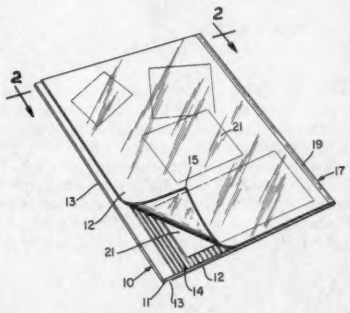
A program unit for an audiovisual educational device which incorporates a series of film transparencies integrated into assembly. The paddlelike assembly, or film slide, includes means for engaging a sprocket or other transport mechanism and coded aperture through which a pin may be selectively inserted either to prevent or permit incremental advancement of the film slide relative to a display station.

3,581,422
FILM HOLDER FOR SLIDE PROJECTOR
Hidenobu Kondo, Kawasaki-shi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Aug. 4, 1969, Ser. No. 847,114
Claims priority, application Japan, Aug. 8, 1968, 43/68244
Int. Cl. G09F 1/12
U.S. Cl. 40—152 3 Claims



A slide film frame for slide projector enables to mounting, dismounting and interchanging of the film with ease. Two glass plates with a film sandwiched therebetween are inserted into the intermediate case of the main frame, and then the main frame is put on one of the covers having arcuated dovetail grooves and thereafter the remaining cover having four projections fittable with the grooves when two covers are relatively rotated by 90°, is put thereon.

3,581,423
DISPLAY UNIT
Benjamin Richard Mascolo, Brownsville, Tenn., assignor to Kleer-Vu Industries, Inc., New York, N.Y.
Filed Sept. 13, 1968, Ser. No. 759,725
Int. Cl. G09f 1/10
U.S. Cl. 40—158B 1 Claim

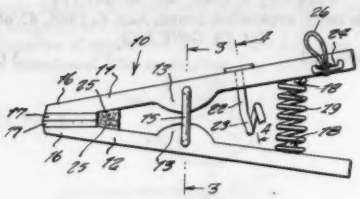


A self-sticking page for photograph albums, production scheduling charts, presentation pages, advertising layouts and the like, wherein there is provided a board or support member having a pair of transparent sheets associated therewith.

3,581,424
FISHERMAN'S DEKINKER
Ben P. Bloom, P.O. Box 333, Maupin, Oreg.
Filed June 11, 1969, Ser. No. 832,369
Int. Cl. A01k 87/00;, 91/00
U.S. Cl. 43—4 5 Claims

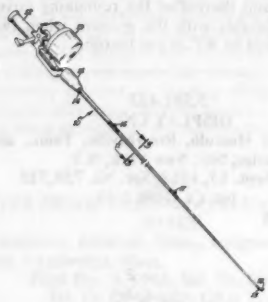
A spring clamp includes a pair of padded jaws at one end

of a pair of levers, one of which is pivotable about a fulcrum link that is rigidly attached to the other lever, and the opposite end of the levers having a compression coil spring



therebetween for normally urging the jaws into engagement with each other. A line guide is attached to one lever and projects into the space between the levers adjacent the spring.

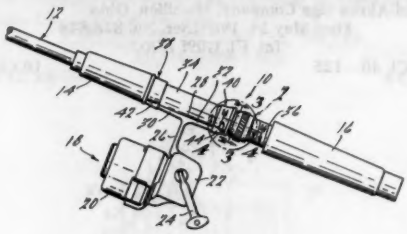
3,581,425
FLEXIBLE SHAFTS
Donald J. Orr, 1617 Hill Ave., Arnolds Park, Iowa
Continuation of application Ser. No. 547,109, Feb. 14, 1966, now abandoned. This application May 6, 1969, Ser. No. 824,374
Int. Cl. A01k *87/00*
U.S. Cl. 43—18 **5 Claims**



A hollow core flexible shaft having a tip end and a butt end, the structure being adapted to receive an applied load at the tip end thereof, the cross-sectional area of the solid portion increasing from the tip end to the butt end in order to provide equal stresses along the length of the shaft. The shaft is provided with a hollow core having a configuration which lies substantially midway between a parabolic curve and a hyperbolic curve with a common vertex substantially at the tip end of the rod, and a common point at the butt end of the rod.

3,581,426
FISHING REEL SECURING DEVICE
Earl E. Miller, Dowagiac, Mich., assignor to Victor Comptometer Corporation, Chicago, Ill.
Filed Feb. 17, 1969, Ser. No. 799,601
Int. Cl. A01k *87/06*
U.S. Cl. 43—22 **14 Claims**

In combination with a fishing rod comprising a handle section adapted to operatively support the mounting section of an associated fishing reel, ferrule means adjustably movable longitudinally of the fishing rod and engageable with the mounting section of the fishing reel for securing the reel on the rod, collar means rotatably mounted on the handle section for limiting longitudinal movement of the ferrule means relative to the reel mounting section, and means including an annular resilient deformable locking ring interposed between the ferrule means and the collar means for resisting rotation of the collar means so as to prevent longitudinal displacement of the collar means relative to the ferrule means and

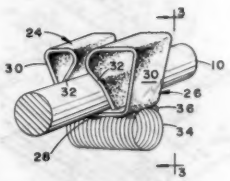


thereby maintain the ferrule means positively engaged with the mounting section of the fishing reel.

3,581,427
FISHING ROD CONSTRUCTION
Reinert M. Reinertson, 229 W. Flint St., Davison, Mich.
Filed July 28, 1969, Ser. No. 845,318
Int. Cl. A01k *87/04*
U.S. Cl. 43—24 **15 Claims**

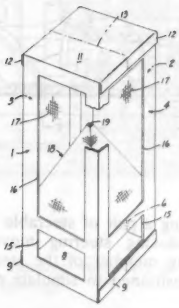
A reel and a line are mounted on a fishing rod and a plurality of pulley assemblies are positioned at longitudinally spaced points along the rod with the fishing line trained over the pulleys. Each pulley assembly is mounted for pivotal movement about an axis generally parallel to the axis of the rod and pivotal movement about an axis transverse to the axis of the rod.

3,581,428
FISHING LINE RETAINER
Warren W. Helder, R.D. 1, Wrightsville, Pa.
Filed Mar. 26, 1969, Ser. No. 810,511
Int. Cl. A01k *87/00*
U.S. Cl. 43—25 **3 Claims**



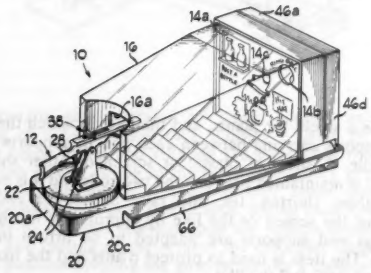
A fishing line retainer comprising support means of several types attachable to a fishing rod between the reel and the line guide nearest the reel, the support means having line clamping means exerting very light, limited friction upon the line to retain the same in a wide obtuse angle between said reel and guide, whereby the drag imposed upon the outer end of the line extending into a moving stream will not remove the line from the clamping means, but the force exerted by a fish upon the line is adequate to pull the line from the clamping means and thus prevent a fish from pulling the fishing rod from supporting means therefor.

3,581,429
INSECT TRAP
Allison L. Hickman, Vallejo; Ernest S. Nagy, Napa, and George A. Scriven, West Napa, all of, Calif., assignors to Gordon Wood, Sansalito, Calif.
Filed Apr. 7, 1969, Ser. No. 813,917
Int. Cl. A01m *1/00*
U.S. Cl. 43—107 9 Claims



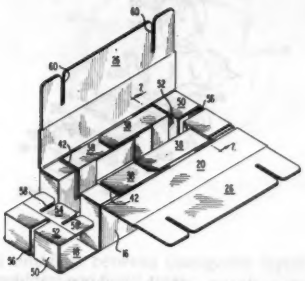
An insect trap of the type which takes advantage of the fact that most insects fly upwardly toward the light after sampling the bait. A trap of this type is provided made of inexpensive disposable material so that when the trap is filled with insects the entire trap may be discarded. The trap is collapsible to a substantially flat form for shipping and handling.

3,581,430
TOY BANK
Marvin I. Glass, Chicago, and Gordon A. Barlow, Evanston, both of, Ill., assignors to Marvin Glass & Associates
Filed Aug. 19, 1968, Ser. No. 753,425
Int. Cl. A63h *33/30*
U.S. Cl. 46—4 3 Claims



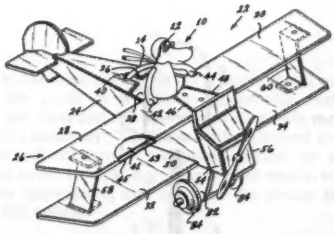
A toy bank of the type wherein a coin is launched at a target as part of the action in depositing the coin in the security portion of the bank, characterized in that the target has a plurality of target areas through which the coin may be fired and, if so successfully fired, falls on a return ramp behind the target areas constructed and arranged to return the coin to the exterior of the bank where it may be launched again. Also, further characterized by a coin receiving surface forwardly of the target area for receiving coins which rebound forwardly from the target area to feed the coins into a security portion of the bank.

3,581,431
FOLDING BLANK BUILDING BLOCK SUPPORTED BY INTERNAL CELL-LIKE STRUCTURE
John R. Trenovan, 1712 Valley Forge Road, Lancaster, Pa.
Filed May 8, 1969, Ser. No. 823,003
Int. Cl. A63h *33/04*
U.S. Cl. 46—24 3 Claims



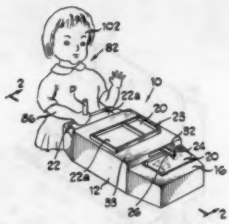
A building block formed from folding a sheet of cardboard or other similar material into a hexahedron. The block structure gains structural strength from foldable extensions on the exterior sides of the hexahedron that fold inwardly of the completed block thereby forming a cell-like network of interior load-supporting walls. The inherent strength of the building block is unaffected regardless of which of the six sides of the block are used as the base or supporting side. The assembly of the building block is simplified in that all folding along the fold lines is done in a relative upward direction.

3,581,432
DOLL MOUNT AND CASE
Sidney Bass, Los Angeles, and Anthony D. Miller, Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed July 31, 1969, Ser. No. 846,361
Int. Cl. A63h *11/10*
U.S. Cl. 46—106 8 Claims



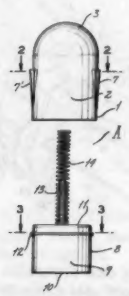
A mount for holding doll apparatus of the type which includes a figure, a support arm extending rearwardly from the figure, and a wheel mounted on the arm so as to enable a child to roll the figure along a table top. The mount includes a wide aperture for receiving the figure, a narrow slot extending rearwardly from the rear of the aperture for receiving the support arm and holding it in place, and an empty space beneath the slot for receiving the wheel of the doll apparatus when the doll is in the mount. The mount is in the form of an airplane, with the figure-receiving aperture formed in the fuselage near the trailing edge of the wings so that figure arms on the doll figure can rest on the wings. The wings can be folded upwardly to hold the doll in a carrying case.

3,581,433
WRITING DOLL
Burton C. Meyer, and Marvin I. Glass, both of Chicago, Ill., assignors to Marvin Glass & Associates
Filed Feb. 10, 1970, Ser. No. 010,250
Int. Cl. A63h *13/00*
U.S. Cl. 46—116 **15 Claims**



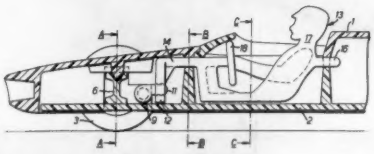
A tracing device which includes a tracing element mounted on a base or structure for free movement to trace characters on a workpiece, and an image forming member movable in response to movement of the tracing element to reproduce an image of the traced characters onto a blank. A doll is positioned adjacent the blank with an arm of the doll positionable over the blank, the arm being journaled on the doll's body so that the end or hand portion of the arm is freely movable over the blank and is connected to the image forming member to give the effect that the doll is duplicating the character traced by manipulation of the tracing element. The doll's body and the doll's head is connected by linkage to the doll's arm to cause relative movement of the doll's body and/or the doll's head in response to movement of the doll's arm over the blank.

3,581,434
ROCKET-SIMULATIVE TOY
Gerald C. Fels, St. Louis, Mo., assignor to Jay V. Zimmerman Company, Clayton, Mo.
Filed Sept. 11, 1969, Ser. No. 857,055
Int. Cl. A63h *13/16*
U.S. Cl. 46—145 **10 Claims**



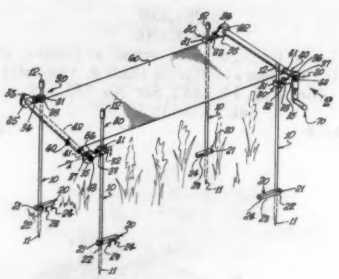
A rocket-simulative toy comprising a projectile and a launching base member; there being spring means mounted on said base and engageable with said projectile for stressing by manual force applied on said projectile, the release of which permits said projectile to be propelled by unstressing of said spring. The projectile and base incorporate mutually engageable, friction-producing means for limited impediment or time delay of spring release.

3,581,435
TOY VEHICLES
Gerald A. Wingrove, Flackwell Heath, England, assignor to The Mettoy Company Limited, London, England
Filed Apr. 16, 1969, Ser. No. 816,632
Claims priority, application Great Britain, Apr. 23, 1968, 19041/68
Int. Cl. A63h *11/10*
U.S. Cl. 46—202 **2 Claims**



A toy vehicle having a pair of steerable road wheels and mechanism for producing steering movement of those wheels, the operating member of the steering mechanism being shaped and positioned to simulate the driver of the vehicle.

3,581,436
PLANT SHIELD
James D. Basiger, 107 N. Kellogg St., Elsinore, Calif.
Filed Sept. 25, 1968, Ser. No. 762,566
Int. Cl. A01g *13/02*
U.S. Cl. 47—26 **1 Claim**

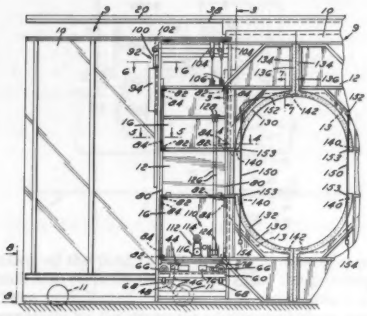


This is a shield for plants, and the like, in which there are four supports carrying between each pair of supports a roll, or spindle. A sheet of plastic or screen or other shielding material is maintained between the two rolls and it is possible to lengthen, shorten, tilt, and raise and lower each end corner of the screen or the like by appropriate mechanism. The four end supports are adapted to be driven into the ground. The item is used to protect plants and the like from birds, sun, rain and the like.

3,581,437
AIRCRAFT HANGAR DOOR
Allan E. Wetter, Bloomfield Township, Oakland County, Mich., assignor to Byrne Doors, Inc., Terndale, Mich.
Filed Aug. 28, 1969, Ser. No. 853,850
Int. Cl. E05f *15/14, 17/00*
U.S. Cl. 49—118 **14 Claims**

An adjustable closure adapted for use with aircraft hangar doors for fitting around an aircraft fuselage projecting through the space between the doors. Each door has a horizontally movable carrier. A pair of closure elements are mounted on each carrier and have recesses shaped to fit

around the fuselage. The closure elements on each carrier are adjustable toward and away from one another and are

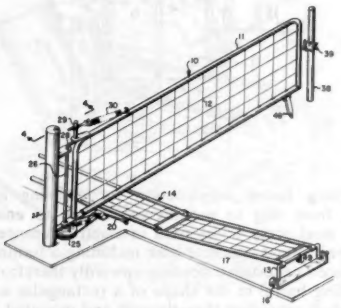


substantially free floating vertically in response to vertical movement of the fuselage.

3,581,438
OFFCENTER PIVOT HINGE GATE

Gottlieb H. Treiber, P.O. Box 84, 609 Stephen, Kerrville, Tex.

Filed June 10, 1969, Ser. No. 831,868
Int. Cl. E05f *13/04*
U.S. Cl. 49—274 **7 Claims**



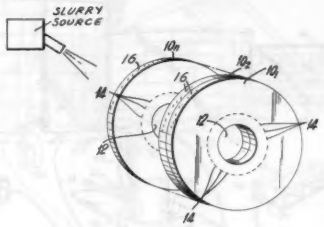
Automatic gate operated by wheel contact and lateral shifting of a hurdle and track rotating a cable driven offcenter hinge lifting and rotating the gate from the closing latch, the gate is swung to the open position by gravity and opening spring action of the offcenter hinge means and retained open by a post open catch. Spring means returning the gate to a closed position upon the vehicle departing the track. The closing spring returns the offcenter hinge to the closed position pivoting the gate imparting a closing motion. The gate is stopped and retained by the closing latch.

3,581,439
BUFF APPARATUS AND METHOD OF MANUFACTURING BUFFS

Elmer W. Jensen, Jr., Mount Veron, N.Y., and Hans R. Jacobsen, Norwalk, Conn., assignors to Geoscience Instruments Corporation, Mount Vernon, N.Y.

Continuation-in-part of application Ser. No. 562,757, July 5, 1966, now Patent No. 3,504,457. This application Apr. 4, 1968, Ser. No. 718,938
Int. Cl. B24b *1/00, 7/00, 9/00*
U.S. Cl. 51—2 **5 Claims**

An improved buff apparatus includes a stacked array of laminated poromeric sheets. The sheets are interlocked by directing wave energy in a direction transverse to the sheets

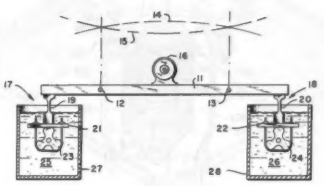


to create and interface between contiguous layers characterized by plural localized fused areas.

3,581,440
RESONANT APPARATUS FOR CLEANING CASTINGS AND THE LIKE

Howard E. McKinney, and Dirk C. A. Koopman, both of La Jolla, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed May 27, 1969, Ser. No. 828,182
Int. Cl. B24b *19/00*
U.S. Cl. 51—7 **8 Claims**



There is disclosed apparatus for treating metal parts by immersing the parts in a media of granular material and coupling the parts and the material to an elastic member that is vibrated resonantly. The parts to be cleaned are coupled by means of selectively compliant means to an elastic member in order to reduce stresses on the elastic member, to reduce the impedance, and enhance the power throughput ability of the system.

3,581,441
SURFACE TREATMENT APPARATUS

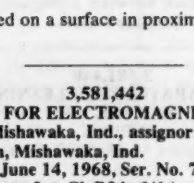
Clarence E. Hulbert, Jr., Houston, Tex., assignor to W. D. Gunnels, Freeport, Tex.

Continuation of application Ser. No. 463,781, June 14, 1965, now abandoned. This application Aug. 9, 1968, Ser. No. 754,094
Int. Cl. B24c *3/06*
U.S. Cl. 51—8 **4 Claims**

Apparatus and method of conveying granular material substantial distances from an open storage container through vessel means which provides alternate vacuum and pressure to chamber means in said vessel means to said material from said vessel means continuously over substantial distances. Distributor outlet means are provided for discharging said

material continuously. Tower means may be utilized to position said distributor outlet means whereby a uniform anchor pattern is provided on a surface in proximity to said distributor outlet means.

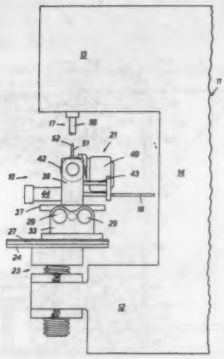
3,581,442
CONTROLS FOR ELECTROMAGNETIC VALVES
Rudolf Destics, Mishawaka, Ind., assignor to The Wheelabrator Corporation, Mishawaka, Ind.
Filed June 14, 1968, Ser. No. 737,183
Int. Cl. B24c *3/14*
U.S. Cl. 51—9 **6 Claims**



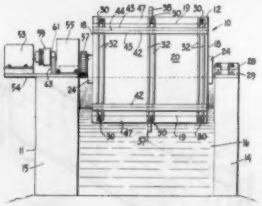
A control system for the passage of abrasive particles into contact with the surfaces of moving objects wherein an electromagnetic valve means is employed for regulating the rate of delivery of the particles. The valve means is operated by an electrical circuit which varies the influence of the magnet on the particles. The variations in influence are achieved in the circuit through the use of a control device which is tied to drive means employed for moving the objects past the mechanisms delivering the abrasive particles. The flow of particles can thus be regulated in accordance with changes in speed of the objects.

3,581,443
GLASS-GRINDING MACHINES
Colin Clayton Mayers, "Tynings" Cobden Hill, Radlett, Hertfordshire, England
Filed Nov. 29, 1968, Ser. No. 779,686
Claims priority, application Great Britain, Nov. 29, 1967, 54,380/67
Int. Cl. B24b *5/00, 7/00, 7/24*
U.S. Cl. 51—107 **10 Claims**

A glass-grinding machine having a holder for a glass, and a grinding wheel to cut the outer surface of the glass, in which the holder is supported on a vertically disposed spindle, rotatable about and movable along its axis, and the grinding wheel is movable towards and away from the axis. There is means to control the movement of the holder and the grinding wheel, so to cut features on the glass according to a predetermined program.



3,581,444
TUMBLING BARREL
Clarence A. Hackett, 1566 Bronson Road, Grand Island, N.Y., and Kenneth J. Hackett, 91 Delton St., Tonawanda, N.Y.
Filed Feb. 23, 1968, Ser. No. 707,733
Int. Cl. B24b *31/02*
U.S. Cl. 51—164 **12 Claims**

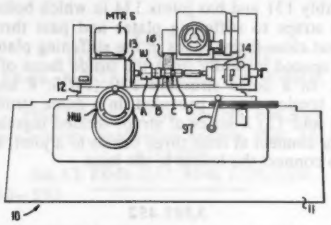


A tumbling barrel construction for cleaning metallics recovered from slag to a sufficient degree to enable the reclaimed steel scrap to be used in electric furnaces, comprising a reinforced concrete base including a footing and a pair of spaced pedestals extending upwardly therefrom and a slag-tumbling barrel in the shape of a rectangular solid and having a shaft extending therethrough and mounted within a sleeve rigidly affixed between opposite end walls with the ends of the shaft mounted in journals on the spaced pedestals, the barrel having two opposite sides each hinged at both opposite edges thereof for opening the barrel, the hinges on the opposite edges of each of the sides permitting the opening of the doors in the most convenient direction for loading and unloading, a reversible motor mounted on one of the pedestals and coupled to the barrel through a drive linkage, a brake associated with the drive linkage for stopping the barrel in any predetermined orientation for loading or unloading, and a ramp built on the footing and underlying a portion of the barrel for routing the dumped metallics to a predetermined location on the footing for easy access by a magnet which lifts them from the footing.

3,581,445
FEED RATE AND WORK SPEED CONTROL FOR GRINDERS
Ralph E. Price, Waynesboro, Pa., assignor to Litton Industries, Inc., Beverly Hills, Calif.
Filed June 10, 1969, Ser. No. 831,828
Int. Cl. B24b *49/00*
U.S. Cl. 51—165 **20 Claims**

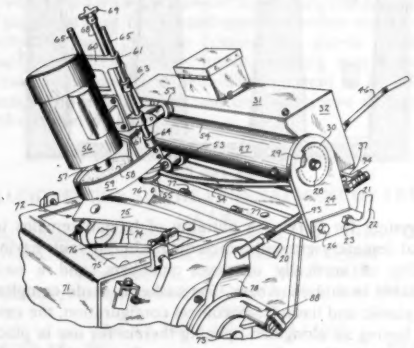
This disclosure relates to a grinder for grinding workpieces

having two or more different diameters and having means for presetting the controls of the grinder to grind such different diameters. In addition, the grinder is provided with means for preselecting the feed rate and work speed for each diameter.



Preselecting of the feed rate is done by means of a punched card which also controls the positioning of the grinding wheel to grind the preselected diameter. The work speed is determined generally by the diameter of the workpiece portion to be ground.

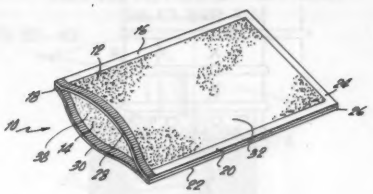
3,581,446
SHARPENERS FOR CUTTING REELS
Wilmer E. Witt; Eugene A. Sousek, and Clyde A. Clish, all of Appleton, Wis., assignors to Koehring Company, Milwaukee, Wis.
Filed Sept. 17, 1968, Ser. No. 760,239
Int. Cl. B24b *19/00*
U.S. Cl. 51—249 **12 Claims**



A rotatable grinding disc is supported on the frame of a cutting reel for movement back and forth along a track tube of the knife cylinder. The tube is rockably mounted to provide for swinging of the grinding disc into and out of a position where the end face of the disc is engageable with one of the knives. There is means including a cam arm and mechanical linkage for transmitting rocking motion to the knife cylinder as the grinding stone progresses axially of the latter so that all portions of the cutting edge of the angled or helical knife are presented in the same relationship to the end face of the stone, and there is manual indexing to bring a new knife into a position to be sharpened.

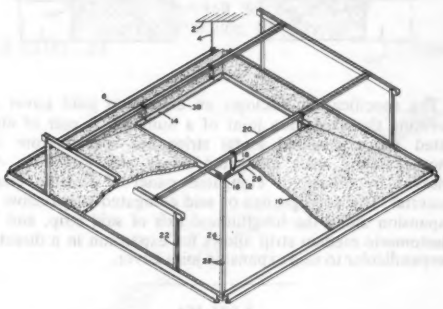
3,581,447
REVERSIBLE SCOURING PAD
Pasquale Joseph Falivene, Union City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Apr. 21, 1969, Ser. No. 817,841
Int. Cl. B24d *11/00;* **B08b** *1/00;* **A47k** *7/02*
U.S. Cl. 51—400 **11 Claims**

A versatile cleansing article and reversible pillow-shaped scouring pad comprising a pair of layers of substrate material each having a strong abrasion surface and a 060264363 milder abrasion surface. The two layers are joined to each other along at least two edges and preferably along three



edges thereof for enabling the pad to be reversed and to permit insertion of soap or detergent in the pillow.

3,581,448
SUPPORT FOR LUMINAIRE AND CEILING PANELS
Henry J. Roux, Willow Street, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Apr. 16, 1969, Ser. No. 816,594
Int. Cl. E04b *5/62;* **F21s** *1/14*
U.S. Cl. 52—28 **3 Claims**

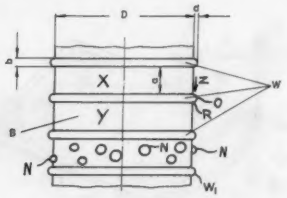


The ceiling is made of a plurality of square modules, each module containing an illuminating means. A support structure mounts a square frame member in the middle and above the grid members forming the lower plane of the ceiling. An illuminating means is mounted in the square frame to define the upper plane of the ceiling. Ceiling boards are rested against the grid members in the lower plane of the ceiling and the frame member in the upper plane of the ceiling to form a module. The module gives the appearance of a square assembly with a square lighting fixture mounted therein and four trapezoidal ceiling panels extending from the grid members of the square module to the square lighting fixture.

3,581,449
APPARATUS FOR REDUCING KARMAN VORTEX STREET EFFECTS ON A STRUCTURE
Franz R. Huber, Assling, and Rudolf Frimberger, Furth, near Munich, both of, Germany, assignors to Rohde & Schwarz, Munich, Germany
Filed Aug. 21, 1968, Ser. No. 754,336
Claims priority, application Germany, Aug. 23, 1967, P 16 84 900.6
Int. Cl. E04h *12/00, 9/14*
U.S. Cl. 52—84 **8 Claims**

Cylindrical structure for use as an outdoor television an-

tenna or the like, on which are formed a plurality of axially spaced embossments for reducing the oscillatory movements

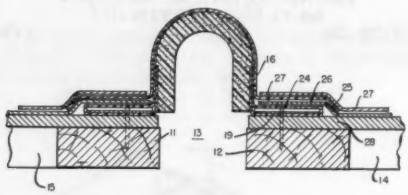


of the structure which may be caused by the development of a Karman vortex street due to wind currents.

3,581,450
EXPANSION JOINT COVER

Francis J. Patry, Old Lisbon Road P.O. Box 15769, Lewiston, Maine

Filed Apr. 18, 1969, Ser. No. 817,312
Int. Cl. E04d *3/38*; **E04b** *1/68*
U.S. Cl. 52—58 **11 Claims**

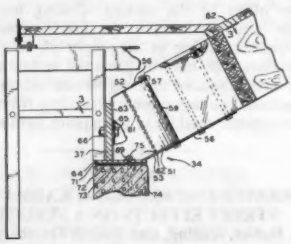


The specification discloses an expansion joint cover for covering the expansion joint of a building. A pair of elongated and corrugated metal strips are spaced from one another along their elongated edges and joined to one another by means of elongated panel of flexible elastic material. The corrugations of said elongated strips allow for expansion along the longitudinal axis of said strip, and the elastomeric median strip allows for expansion in a direction perpendicular to said expansion joint cover.

3,581,451
DOME STRUCTURES

George R. Birkemeier, and Hollis C. Scott, Portland, both of, Oreg., assignors to Timber Structures, Inc., Portland, Oreg.

Division of Ser. No. 729,952, May 17, 1968, Pat. No. 3,540,174.
Int. Cl. E04b *1/38, 7/10*
U.S. Cl. 52—94 **3 Claims**

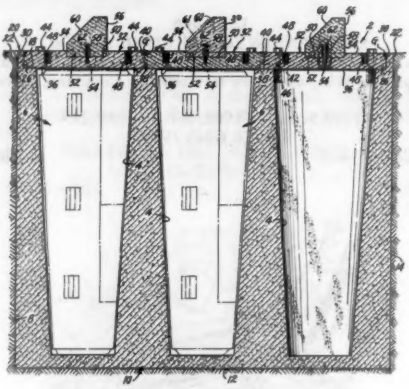


A dome structure 20 FIGS. 1 to 5) includes beams connected together in triangles by joints 31 and 32 and connected to a tension ring by joints 34. In each joint 31, bolts pass through straps connected to the beams and pass through clearance notches in stiffener plates welded to a tube and pass through and bear laterally against the inner periphery of the tube. Each joint 34 is similarly connected to the beams, has a vertical plate 63 connected to a tension ring and a baseplate splined for radial movement only relative to the supporting wall. Low-friction facings on the baseplate and a supporting plate on the wall permit easy radial sliding. A dome structure 120 (FIGS. 6 and 7) has a double tension ring assembly 131 and has joints 134 in which bolts connect the beam straps to stiffening plates and pass through and bear against close-fitting holes in the stiffening plates, which holes are spaced inwardly from the inside faces of tubes of the joints. In a dome structure 220 (FIGS. 8 and 10), a laminated tension ring is provided. In a dome structure 320 (FIGS. 11 and 12) a series of straps welded together in the same plane connect at least three beams to a joint, and shear plates also connect the beams to the joint.

3,581,452
BURIAL SYSTEM WITH SEALED CASKET MADE OF PLASTIC

Donald A. Jalbert, 616 E. 4th St., Bartlesville, Okla.

Filed Apr. 1, 1968, Ser. No. 717,628
Int. Cl. E04h *13/00*; **A61g** *17/00*
U.S. Cl. 52—133 **7 Claims**

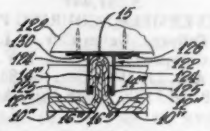


A system for burying a plurality of human remains in a normal cemetery gravesite, including a burial vault having a plurality of vertically disposed chambers, and a casket receivable in said chambers. The casket is made completely from plastic and has a frustoconical configuration, the casket body having an elongated opening therein for use in placing the remains in the casket, and to thereafter provide for viewing of the remains. Cover means is provided to close the opening, and is welded in place to provide a completely sealed casket.

3,581,453
FIBROUS CEILING SURFACING SYSTEM

Isaac Palmer Jones, Granville, and Daniel A. Mc Cartan, Heath, Ohio, assignors to Owens-Corning Fiberglas Corporation

Filed Jan. 2, 1969, Ser. No. 789,106
Int. Cl. E04b *1/86, 5/60*
U.S. Cl. 52—493 **13 Claims**



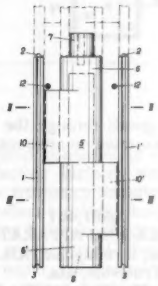
A molded fibrous surfacing system including tiles or panels and supporting means, and a method of producing the same

wherein a mass of fibrous material, such as glass fibers, impregnated with a binder is compressed and shaped during compression to produce edge configurations enabling the respective panels of being supported in alignment from a main support surface.

3,581,454
FORMWORK ELEMENT

Herbert Fitzek, A-9523 Landskron, near Villach, (Karnten), Austria

Filed Mar. 12, 1969, Ser. No. 806,540
Claims priority, application Austria, Mar. 14, 1968, A2514/68
Int. Cl. E04b *2/38*; E04c *1/10, 2/10*
U.S. Cl. 52—593 10 Claims

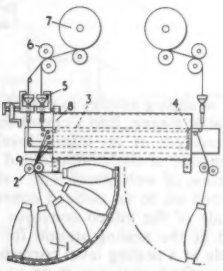


A formwork element for the production of a concrete wall of which the formwork element forms part, comprising a pair of panels, at least two spaced-apart connector members connected to each panel to connect the panels together in spaced-apart relationship, interconnecting means disposed between said panels to permit the element to be interconnected with a further element disposed above or below the first-mentioned element.

3,581,455
MACHINES FOR THE HEAT TREATMENT OF TEXTILE YARNS

Eric Thomas Scriven, The Orchard, Firs Drive, Gustard Wood, Wheathampstead, Hertfordshire, England

Filed Jan. 21, 1969, Ser. No. 792,610
Claims priority, application Great Britain, Jan. 19, 1968, 3030/68
Int. Cl. D02g *3/00*; D02j *13/00*
U.S. Cl. 57—34 12 Claims

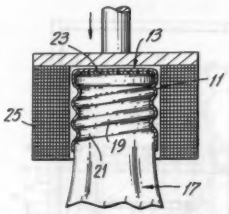


This invention relates to yarn-processing machinery and is characterized in that a yarn-processing machine comprises at least one electrical yarn-heating unit which is slidably mounted transversely of the machine. Each yarn-heating unit has a heat transfer surface or plate disposed in a nonvertical and preferably substantial horizontal plane with its longitudinal axis extending transversely of the machine, means being provided for guiding the yarn transversely of the machine past the heat transfer surfaces or plates.

3,581,456
APPLYING A THREADED CLOSURE BY MAGNETIC IMPULSE

Robert Andrew Gere, Belle Mead, N.J., assignor to American Can Company, New York, N.Y.

Filed Nov. 18, 1968, Ser. No. 776,335
Int. Cl. B65b *7/28*
U.S. Cl. 53—42 1 Claim

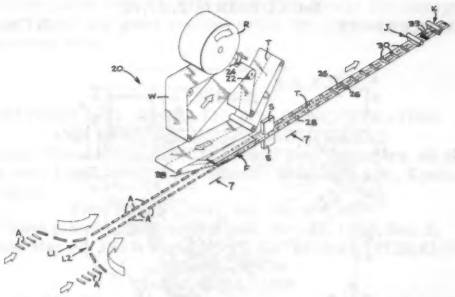


A method for forming a closure on the neck finish of a filled container which utilizes the force generated by a transient magnetic field. The skirt of a cap, positioned on the neck of the container, is urged by the field against the neck finish so as to cause the skirt to conform to the contours of the neck finish and to thereby hold the cap in engagement with the neck finish upon the neck of the container.

3,581,457
WRAPPING METHOD AND APPARATUS

Carl J. Gerlach, and Jerome J. Vande Castle, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Filed Apr. 30, 1969, Ser. No. 820,407
Int. Cl. B65b *9/06*; B65d *71/00*
U.S. Cl. 53—28 7 Claims



The disclosure concerns a wrapping machine, a wrapping method, and the package formed by the machine and method. The side edges of a single web are folded around two laterally aligned articles and edge sealed to the remaining web near a central tear line along the single thickness of web interconnecting the packages. By forming two packages from a single web, the web can be run about as fast as any single web used in the known single file wrapping method, whereby the output of the machine in finished packages is substantially doubled over the output of a machine producing packages with the single file method.

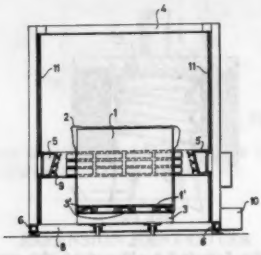
3,581,458
METHOD OF SHRINKING A SLEEVE- OR CAP-SHAPED WRAPPING OF HEAT-SHRINKABLE PLASTIC SHEET SURROUNDING A TRANSPORT UNIT AND AN APPARATUS FOR CARRYING OUT THE METHOD

Olov Erland Gustavsson, Industrivagen 10, Kungalv, Sweden

Filed Mar. 20, 1968, Ser. No. 714,724
Claims priority, application Sweden, Feb. 7, 1968, 1585/68
Int. Cl. B65b *53/02*
U.S. Cl. 53—30 8 Claims

Shrinking of a contractive wrapping of heat-shrinkable

plastic sheet surrounding a transport unit composed of collected or piled objects, preferably on a pallet, is accomplished by directional heat radiation from electrical emitters mounted on one or more carriers and by effecting a relative movement between the wrapped unit and those emitters or vice versa. Selective energizing of said emitters permits irradiation of selected areas of the wrapping only for maintaining the tensile strength of the wrapping at sharp corners and

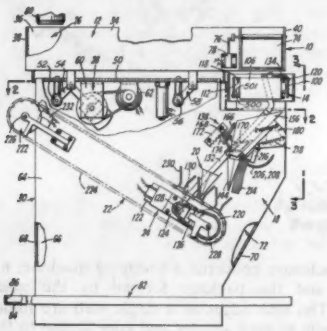


edges of the transport unit. Lamination of a folded top portion of the wrapping may be effected. An apparatus for carrying out the shrinking of the wrapping comprises a carrier for a plurality of heat radiation emitters and means for effecting the relative movement. Two forms are disclosed, one in which the emitter carrier is a vertically movable, horizontal frame and one in which the emitter carrier is in the form of gates through which the wrapped transport unit is carried by conveyors.

3,581,459
BAGGING MACHINE

James D. Elliott, Riverside, and Alex G. Osika, Springdale, both of, Conn., assignors to American Machine & Foundry Company

Filed Oct. 27, 1967, Ser. No. 678,574
Int. Cl. B65b *1/32, 57/10*
U.S. Cl. 53—59 **8 Claims**



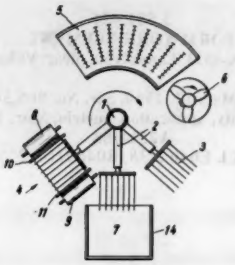
A bagging machine comprising means to assemble respective portions into respective bags; means dispensing said bags individually adjacent said assembly means; and means controlling and coordinating the timing and operation of said assembling means and said bag dispensing means.

3,581,460
WRAPPING MACHINE

Helmut Graf Lambsdorff, Monchengladbach, and Karl Birkendahl, Solingen, Germany, assignors to VERTEC Gesellschaft Fur Verpackungstechnik mbH & Co., Monchengladback, Germany

Filed Jan. 16, 1969, Ser. No. 791,809
Claims priority, application Germany, Jan. 18, 1968, May 30, 1968, P 16 11 901.0 and P 17 61 523.5
Int. Cl. B65b *53/02, 11/08*
U.S. Cl. 53—124 **14 Claims**

A machine for wrapping or packaging goods in shrinkable foil, wherein a plurality of operating stations are arranged along a substantially circular path and a plurality of carriers for the goods are rotatable along this substantially circular

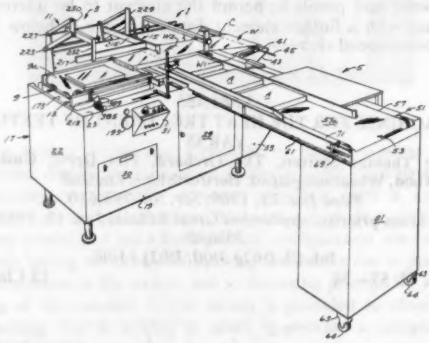


path to advance the goods through the operating stations. The carriers may be mounted on arms rotatable about a central axis.

3,581,461
PACKAGING APPARATUS

Walter R. McDurmont, Birmingham, Ala., assignor to South-Steel Corporation, Trussville, Ala.

Filed Apr. 29, 1969, Ser. No. 820,208
Int. Cl. B65b *9/06, 61/10*
U.S. Cl. 53—182 **19 Claims**



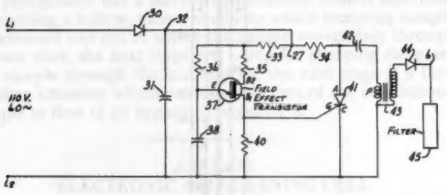
Apparatus for wrapping articles in plastic film in which articles are fed, one at a time, into a center-folded web of film by an infeed conveyor at an infeed level. The infeed is through the open side of the center-folded web at right angles to the direction of web travel. The web with an article therein is advanced on to an outfeed conveyor at a sealing station at one side of the infeed conveyor. An L-bar sealer unit is provided at the sealing station for sealing the web around the article at a sealing level corresponding to the infeed level. The outfeed conveyor is on an elevator and, on advance of the web with an article therein to the sealing station, occupies a raised position at the infeed level. It is then lowered to a sealing position below the infeed level and below the sealing level a depth equal to one-half the thickness of the article for centered sealing of the web around the article, i.e., sealing of the web at the midheight of the article, and then returned to its raised infeed-level position for discharge of the completed package and delivery of the next article.

3,581,462

METHOD AND APPARATUS FOR INDUCTIVELY CHARGING A FILTER OF COMBINED METAL AND DIELECTRIC MATERIAL FOR COLLECTING NORMALLY CHARGED AIR BORNE PARTICLES

William W. Stump, 2768 Locust Drive, Bridgeville, Pa.

Filed Dec. 23, 1968, Ser. No. 786,217
Int. Cl. B03c 3/00
U.S. Cl. 55—2 13 Claims



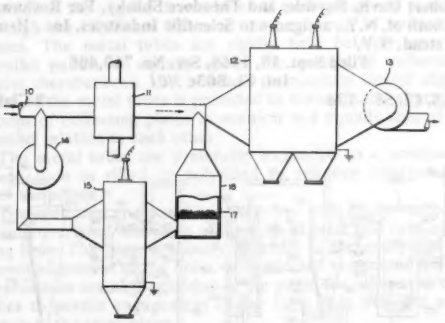
Monocharging a filter consisting of electroconductive and nonconductive collecting surfaces with an inductive field supplied from a low frequency pulsating direct current voltage to attract and collect normally charged particles. This inductive filter charging field permits the use of a metal plate or grid filter or a monocharged filter of highly insulative materials including paper, plastics such as fiber glass, open cell foam or plastic screen. A grid conductor must be employed to charge these nonconductive dielectric materials. Metal plates, wire screens and grids, metal shavings, metal wools inductively charged distribute the monocharge of low voltage low frequency over their own surfaces as well as the insulating or dielectric portions of the filter. This monocharged filter requires no ground or return circuit and merely produces a slight shock if touched but is not harmful.

3,581,463

ELECTROSTATIC GAS CLEANING

Lawrence M. Roberts, Bound Brook, N.J., assignor to Research-Cottrell, Inc., Somerset County, N.J.

Filed Oct. 26, 1967, Ser. No. 678,300
Int. Cl. B03c 3/01
U.S. Cl. 55—4 3 Claims



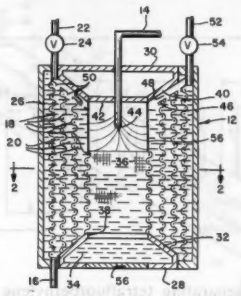
Suspended matter is removed from combustion gases containing sulfur dioxide by removing a major portion of the particulate matter from a minor portion of the gases, catalytically converting a major portion of the sulfur dioxide content of said minor portion of the gases to sulfur trioxide, mixing said minor portion of the gases with the main gas stream and subjecting the mixed gases to electrical precipitation.

3,581,464

METHOD OF AND APPARATUS FOR SEPARATING A LIQUID FROM LIQUID VAPOR AND DISSOLVED GASES

Pravin G. Bhuta, Torrance, and Arthur K. Williams, Woodland Hills, both of, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 16, 1968, Ser. No. 784,016
Int. Cl. B01d 19/00
U.S. Cl. 55—43 11 Claims



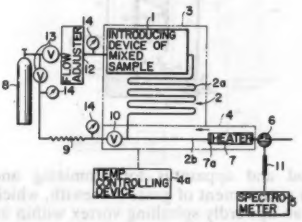
A multistage phase separator for separating the liquid and gaseous phases of an entering fluid by passage of the latter through a number of successive porous capillary phase separation barriers which pass the liquid phase but block passage of vapor and gasses by means of a surface tension screening action. A phase separation method and apparatus for separating a liquid from its vapor and dissolved gases by passage of the liquid through one or more phase separation zones each of which is vented to a reduced pressure region to effect dissolution of the dissolved gases and is followed by a capillary phase separation barrier which blocks the passage of the vapor and gases evolved within the preceeding phase separation zone.

3,581,465

METHOD AND APPARATUS FOR CONCENTRATING AND TRAPPING SAMPLE COMPONENT

Tatsuro Haruki; Muneaki Itaya, and Yasuo Natsuhara, all of Kyoto, Japan, assignors to Shimazu Susakusho Ltd., Kyoto, Japan

Filed Nov. 27, 1967, Ser. No. 685,907
Claims priority, application Japan, Nov. 25, 1966, Dec. 5, 1966, May 30, 1967, Dec. 1, 1967, 42/77210;41/79728;42/3 4386;41/78803
Int. Cl. B01d 15/08
U.S. Cl. 55—67 5 Claims



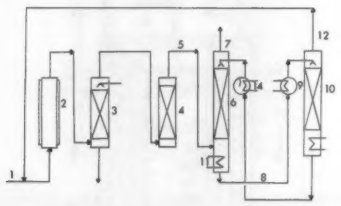
A method and apparatus for separating a mixed sample of gas, fluid or solid into its components trapping each component in its concentrated state in a column having a temperature gradient along the length thereof and removing each component from said column by controlled heating thereof for subsequent introduction into a spectrometer.

3,581,466

PROCESS OF SEPARATING TETRAFLUOROETHYLENE FROM GAS MIXTURES CONTAINING THE SAME

Werner Rudolph; Vbber Han Anderten, and Joachim Massonne, all of Hannover, Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Dec. 2, 1969, Ser. No. 886,608
Claims priority, application Germany, Dec. 5, 1968, P 18 12 820.6
Int. Cl. B01d *53/00*
U.S. Cl. 55—71 7 Claims



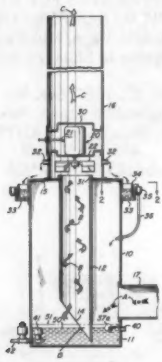
Process for separating tetrafluoroethylene from gas mixtures containing the same produced in the pyrolysis of difluoromonochloromethane which comprises passing such a gas mixture which has been freed of hydrogen chloride, at a temperature between +20° and −30° C. in countercurrent contact with methylisobutylketone and removing the tetrafluoroethylene at the top of the separator and the methylisobutylketone loaded with the remaining components of the pyrolysis gases at the bottom of the separator.

3,581,467

METHOD AND APPARATUS FOR VORTICAL LIQUID-GAS MOVEMENT

Frank M. Donnelly, 5773 Belmont Ave., Cincinnati, Ohio

Filed Dec. 4, 1969, Ser. No. 882,004
Int. Cl. B01d *47/02*
U.S. Cl. 55—89 7 Claims



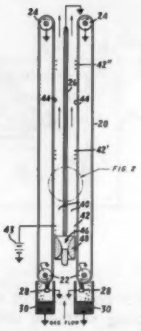
A method and apparatus for atomizing and elevating liquids with entrainment of gases therewith, which comprises generating an upwardly spiralling vortex within an elongated substantially vertical duct having an orifice at the top and a nonhorizontal configuration at the bottom defining a bottom orifice, at least a portion of the bottom of the duct being submerged in a reservoir of the liquid. Application of subatmospheric pressure to the interior of the duct results in atomization and elevation of the liquid within the confines of the bottom orifice, optional entrainment of gases therewith and vortical upward movement th reof. The reservoir is maintained at a level such as to keep at least a portion of the bottom of the duct submerged in the liquid.

3,581,468

TURBULENCE INDUCING ELECTROGASDYNAMIC PRECIPITATOR

Meredith C. Gourdine, West Orange; Geza Von Voros, Glen Rock, and Ta Kuan Chiang, Berkeley Heights, all of, N.J., assignors to Gourdine Systems, Inc., Livingston, N.J.

Filed Apr. 9, 1969, Ser. No. 814,676
Int. Cl. B03c *3/10*
U.S. Cl. 55—114 20 Claims



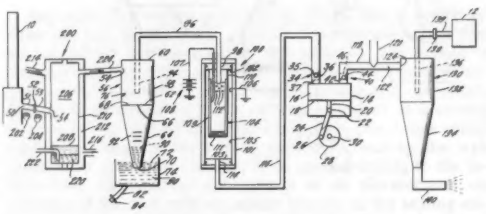
An electrostatic precipitator in which particles entrained in the gas stream are charged electrically by a corona discharge field established in opposition to the gas stream between a plurality of emitter electrodes and a screen attractor electrode upstream of an surrounding the emitter electrodes, inducing turbulence in the stream. The velocity at which the particles pass through the charging field is increased by a dielectric converging-diverging nozzle located across the gas stream closely adjacent the particle charging field to retard migration of the charged particles to the screen attractor. The charged particles are collected downstream of the discharge field on an electrically charged moving dielectric member by which an electric precipitation field terminating at a passive reference electrode is maintained across the gas steam. Charges and charged particles are held on the collection surface of the dielectric member by an electric field created between that surface and a conductive member adjacent the opposite surface of the dielectric member. At a location isolated from the gas stream, the collected particles are removed from the collecting surface.

3,581,469

CONDITIONER FOR GASEOUS SAMPLE

Robert Davis, Bayside, and Theodore Shlisky, Far Rockaway, both of, N.Y., assignors to Scientific Industries, Inc., Hempstead, N.Y.

Filed Sept. 18, 1968, Ser. No. 760,408
Int. Cl. B03c *3/01*
U.S. Cl. 55—126 9 Claims



A conditioner for removing particulate and liquid impurities from a gaseous sample comprising a number of stages in sequence; there is an initial stage, optional with the designer, which consists of a means for cooling the gaseous sample before it passes to the conditioner; the first stage of the conditioner is a cyclone, which is an enclosed chamber against the

interior wall of which the sample makes first contact; the particulate impurities spiral down the chamber wall and eventually settle in a liquid filled trap at the lower end of the cyclone; a manometer is formed by the liquid in the trap and the open lower end of the cyclone, where the liquid is drawn into the lower end of the cyclone by the reduced pressure within the cyclone due to sample being drawn out of the cyclone; as its next stage, the conditioner has an electrostatic precipitator through which the treated gaseous sample passes; the high electric potential ionizes the remaining particulate impurities and causes same to cling to an electrode of the precipitatior, and also vaporizes the liquid impurities; the precipitator has a novel high potential central electrode comprising a hollow, closed shell into which incoming sample is delivered and out of which the sample moves only through narrow slots; the next stage is a pump for pumping the gaseous sample through the conditioner; the next stage is a flow dividing chamber which enables only part of the conditioned sample to flow to an apparatus requiring it.

3,581,470

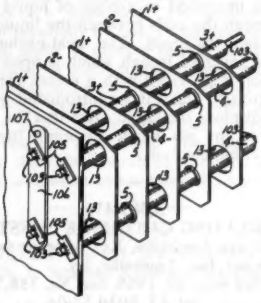
ELECTRONIC AIR CLEANING CELL

Paul Aitkenhead, Ross Township, Allegheny County; Robert Ruhlman, Pittsburgh, and Lewis G. McClintock, Pittsburgh, all of, Pa., assignors to Electro-Air Division, Emerson Electric Company

Continuation-in-part of application Ser. No. 530,993, Mar. 1, 1966, now abandoned. This application Dec. 30, 1969, Ser. No. 889,142

Int. Cl. B03c *3/00*

U.S. Cl. 55—138 **18 Claims**



An electronic air cleaner having a series of alternate groups of parallel collecting plates, each group having spaced aligned predrawn holes and clearance holes and sections of metal tubes of equal length expanded and locked in precise position in the aligned drawn holes of each group and passing through the clearance holes of another group of collecting plates. The metal tubes are rigidly held between spaced parallel panels to equally space the groups of collecting plates therebetween and a means to maintain lateral alignment of the metal tubes is provided to maintain the alternate groups of collecting plates in position and equally spaced in parallel relation to each other.

The metal tubes are preferably expanded to a nonround shape such as rifled or polysided to enhance engagement with the plates.

The preferred end panel is conductive with spaced cutouts having overlying insulating plates with at least one tube aligning hole. The plate is loosely attached to the end panel to permit alignment of the holes with selected conductor tubes. Depressions are also provided in the panel for other selected tubes to permit engagement of the tube ends with the end panels in the same plane.

3,581,471

INCLINED WET-OIL HEATER-TREATER

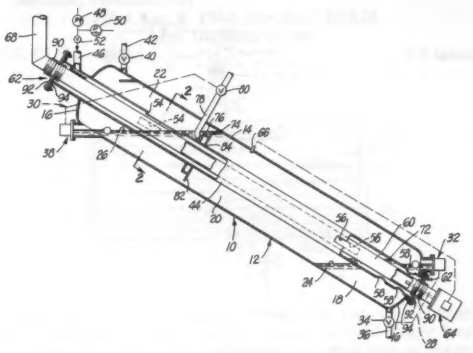
Logan C. Waterman, Houston, Tex., assignor to Petrolite Corporation, St Louis, Mo.

Filed May 7, 1969, Ser. No. 822,629

Int. Cl. B01d *19/00*

U.S. Cl. 55—175 **9 Claims**

A nonelectric treater for resolving water-in-oil dispersions by the application of heat. The treater includes: an inclined elongated container providing a water zone at its lower end, an elongated oil zone intermediate its ends and a gas zone at its upper end; a wet-oil inlet tube in an extending axially of the container from its upper end and provided with port means communicating with the annulus between the inlet tube and the container; a heater tube within and extending



axially of the inlet tube and extending axially through the container from its lower end to its upper end; a burner assembly connected to the lower end of the heater tube; supports for the heater tube capable of accommodating differential thermal expansion of the heater tube and the inlet tube or the container in the axial direction; and an annular dry-oil collector encircling and carried by the inlet tube within and adjacent the upper end of the oil zone.

3,581,472

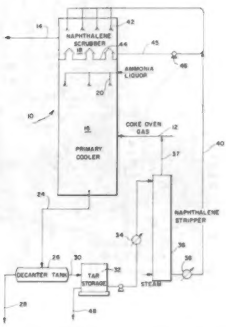
SYSTEM FOR THE REMOVAL OF NAPHTHALENE FROM COKE OVEN GAS

Herbert A. Grosick, Gibsonia, Pa., assignor to Koppers Company, Pittsburgh, Pa.

Filed Aug. 8, 1969, Ser. No. 848,528

Int. Cl. B01d *19/00, 53/00*

U.S. Cl. 55—48 **10 Claims**

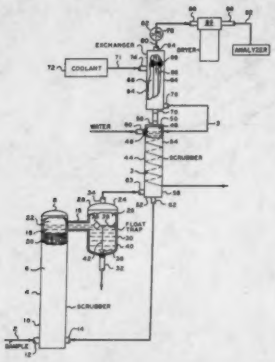


An improved system for the removal of naphthalene from coke oven gas which comprises cooling coke oven gas in a primary cooler to a temperature of about 100° F. to condense a light oil fraction (primary cooler tar) from the gas; collecting and withdrawing the condensed tar from the primary cooler, stripping naphthalene from the tar, and thereafter scrubbing naphthalene from the cooled gas with the stripped primary cooler tar.

3,581,473
SAMPLING APPARATUS

Otis E. Ririe, Jr., Bartlesville, Okla.; John M. Magee, Bay City, and Herbert A. Ems, Sweeny, both of, Tex., assignors to Phillips Petroleum Company

Filed Apr. 23, 1969, Ser. No. 818,708
Int. Cl. B01d 47/00
U.S. Cl. 55—219 3 Claims

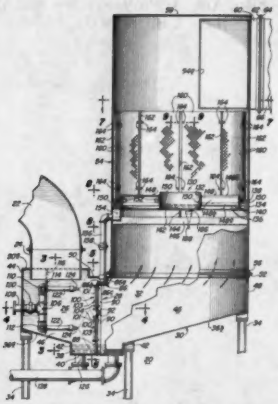


An apparatus for preparing a gaseous sample stream for analysis by means passing said sample through a first scrubbing column, a second scrubbing column containing scrubbing liquid flowing in an opposed direction relative to the flow direction of the sample, a heat exchanger, and a drying column.

3,581,474
GAS SCRUBBER

Roger F. Kent, Mount Prospect, Ill., assignor to National Dust Collector Corporation, Skokie, Ill.

Filed Apr. 14, 1969, Ser. No. 815,820
Int. Cl. B01d 47/06
U.S. Cl. 55—226 19 Claims

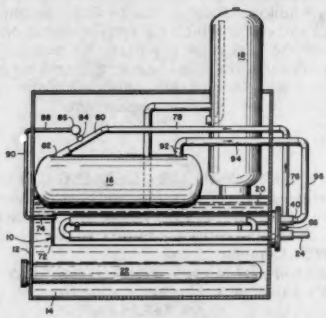


A gas scrubber comprising a housing having an inlet and an outlet for gas, and a grid structure dividing said housing between said inlet and outlet and having an inlet side and an outlet side. The grid structure includes a support frame and one or more grid assemblies removably mounted thereon, each grid assembly employing a plurality of parallel grid elements. Wetting means is provided for introducing a contaminant-collecting scrubbing liquid on the inlet side of the grid structure onto the grid elements for intimate mixing with the gas and flow therewith through the passages between the grid elements, and separator means is provided for removing contaminated scrubbing liquid from the gas after passage through the grid structure.

3,581,475
VARIABLE HEAT-EXCHANGE SYSTEM

Robert A. Sauder, Emporia, Kans., assignor to Sauder Tank Company, Inc., Emporia, Kans.

Filed Apr. 4, 1969, Ser. No. 813,435
Int. Cl. B01d 51/00
U.S. Cl. 55—269 7 Claims

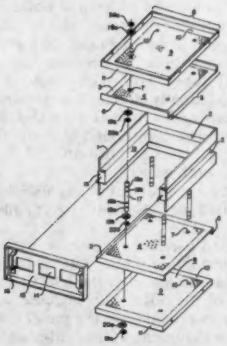


A heat-exchange system involving heat-exchange coils adapted to be immersed in a body of liquid to effect heat exchange through the coils between the liquid and the fluid flowing through the coils. The heat-exchange coils are covered by an inverted trough which is open at the bottom only and which is provided with a means for introducing a gas into the trough. Gas can be introduced into the trough, therefore, to displace the liquid, such that the heat exchange is now between the gas which surrounds the coils and the fluid flowing within the coils.

3,581,476
FLUID-TREATING CARTRIDGE CONSTRUCTION

Richard D. Rivers, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Sept. 10, 1968, Ser. No. 758,743
Int. Cl. B01d 53/04
U.S. Cl. 55—387 5 Claims

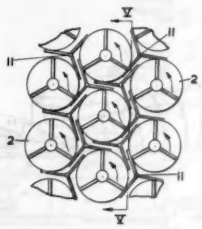


A disposable cartridge having chamber means to be filled with selected fluid-treating material and fluid flow conduit means to direct a fluid stream through the fluid-treating material for removal of impurities or undesirable substances carried by the fluid. The cartridge includes a frame member adapted to receive perforate plate members in spaced relation to form alternate fluid flow chambers and chambers to hold the selected fluid-treating material.

3,581,477
CENTRIFUGAL SEPARATORS

David George Bell, Aldershot; Christopher John Hyatt, Farnham, Surrey, and John Brian McGarry, Aldershot, all of, England, assignors to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 17, 1969, Ser. No. 799,555
Claims priority, application Great Britain, Feb. 22, 1968, 8618/68
Int. Cl. B01d *45/16*
U.S. Cl. 55—347 5 Claims

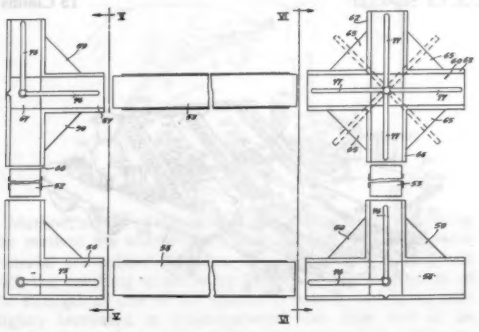


A helical vane assembly extends along a cylindrical tube with an annular space surrounding the vane. Air passing along the center of the tube is swirled by the vanes and any particles of dust or other foreign matter are centrifuged into the annular space to be entrained by axial flow passing along it to a flow diverter whereby it is led away from the main stream which is then "deswirled." The annular space may be divided circumferentially by radial vanes extending along the tube in an axial sense. A number of tubes may be assembled together in a panel; a more compact panel may be obtained by the use of hexagonal tubes. In a further development, the intermediate walls between adjacent vane assemblies are omitted and a series of trefoil baffles inserted in the interstices between the assemblies. The arms of the baffles cooperate with the vane assemblies to define axially extending passages around them and to provide support.

3,581,478
FILTER AND FILTER ASSEMBLY

Peter W. Smith, 1, Stratton Avenue, Clay Hill, Enfield, England

Filed Feb. 20, 1969, Ser. No. 801,001
Claims priority, application Great Britain, Feb. 21, 1968, 8459/68
Int. Cl. B01d *25/22*
U.S. Cl. 55—484 3 Claims

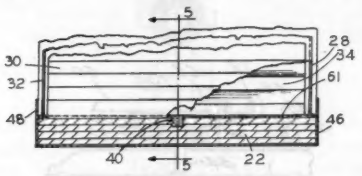


An air or gas filter element composed of filter material in the form of a panel surrounded by a rectangular frame having a peripheral rim projecting in a direction at right angles to the general plane of the element, and an assembly composed of a plurality of the elements set in rectangular openings in a lattice structure built up of lengths of channel-section material pushed into sockets in joint members, resilient seatings in the channels with which the edges of the rim make airtight joints, and quick-release clamps to retain the elements in the lattice.

3,581,479
FILTER

Roger T. Goulet, Liverpool, and Ernest Zednik, East Syracuse, both of, N.Y., assignors to Cambridge Filter Corporation, Syracuse, N.Y.

Filed Apr. 8, 1968, Ser. No. 719,628
Int. Cl. B01d *27/06*
U.S. Cl. 55—499 5 Claims

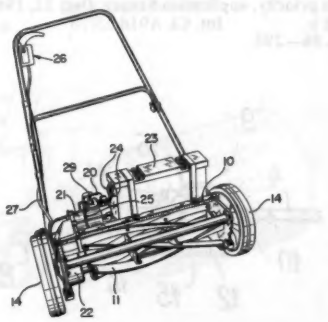


Filter having a rectangular frame, the top and bottom frame members having a central groove on their inside face extending to at least one end of the top and bottom members, a filter core within the frame having a length of sheet filter media disposed in pleated formation within the frame, with the respective end edges of the media sealed to the frame end members, and the pleated side edges of the filter embedded in a slab of sealant extending across the inside faces of each of the top and bottom frame members and filling the grooves of said top and bottom members and the method of injecting the sealant in liquid form by means of the groove.

3,581,480
MULTIPLE-FUNCTION RECEPTACLE AND INTERCONNECTING PLUGS THEREFOR

William H. O'Connor, III, and Edwin J. Weber, both of Baltimore, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

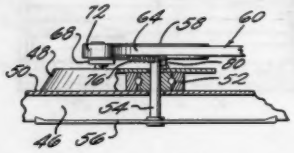
Filed Sept. 30, 1969, Ser. No. 864,278
Int. Cl. A01d *35/24*; H01r *27/00*
U.S. Cl. 56—26 25 Claims



A receptacle to which the cutter drive motor and battery of a cordless electric lawn mower are connected, the receptacle having obstructing members arranged in a selected pattern. Plugs are also provided for interconnection therewith, the plugs having corresponding obstructing members so that connectors in the plugs can engage connectors in the receptacle only when the members are arranged in nonabutting relationship. In the specific application to a lawn mower, one plug is provided for making connection between the mower and the battery in either a forward or reverse manner so as to provide the mutually exclusive functions of mowing and shar-

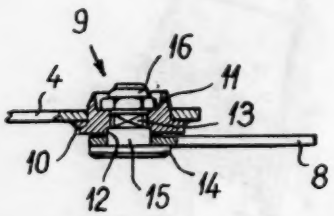
pening. Another plug is provided for connecting the battery to a recharging unit while simultaneously preventing the user from attempting to drive the motor during the recharging operation.

3,581,481
ROTARY MOWER BLADE BRAKE
Rudolph A. Hanson; Edward J. Ziegler, and John E. Fischer, all of Jackson, Mich., assignors to Yard-Man, Incorporated, Jackson, Mich.
Division of Ser. No. 552,012, May 23, 1966, Pat. No. 3,466,855. Filed May 26, 1969, Ser. No. 827,676
Int. Cl. A01d *35/26*
U.S. Cl. 56—25.4 **3 Claims**



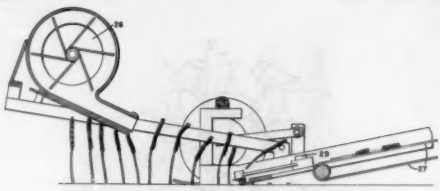
A braking mechanism for use with rotary lawn mowers utilizing a vertically disposed blade shaft having a lower end upon which is attached a mower blade, and having an upper end mounting a belt-driven pulley wherein clutching of the blade shaft is achieved by tightening and loosening the drive belt. The blade brake consists of mechanism mounted upon the mower blade housing structure maintaining engagement of the belt and the blade shaft pulley when the belt is released wherein rotational "coasting" of the blade is minimized due to the slackened belt being "dragged" and driven by its engagement with the blade shaft pulley.

3,581,482
DEVICES FOR FASTENING AND PROTECTING THE CUTTERS OF ROTARY MOWING MACHINES
Walter E. Reber; Adrien J. Formery, and Wilhelm H. M. Van Den Heuvel, all of Saverne (Bas-Rhin), France, assignors to Kuhn Freres & Cie, Saverne (Bas-Rhin), France and Kuhn Freres & Cie, Saverne (Bas-Rhin), France
Filed Nov. 22, 1968, Ser. No. 778,246
Claims priority, application France, Dec. 22, 1967, 133568
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **8 Claims**



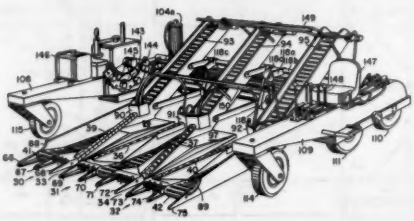
Device for fastening and protecting cutter elements of a rotary mowing machine which are mounted on the marginal portion of supporting discs secured to the main bar of the mowing machine, characterized in that each cutter element is secured by a suitable bolt provided with a self-locking nut protected by a device consisting of an integral collar and washer assembly adapted, when tightened, to permit the backward pivoting movement of the relevant cutter element when the latter engages a resistant obstacle, adequate members being provided for preventing the distortion of said cutter elements and protecting the disc fastening means.

3,581,483
ASPARAGUS HARVESTER AND METHOD OF HARVESTING ASPARAGUS
Victor P. Kohl, R.F.D., and Marion G. Amick, R.D.1, both of Middletown, Del.
Filed Mar. 26, 1969, Ser. No. 810,456
Int. Cl. A01d *45/00, 55/00*
U.S. Cl. 56—327 **8 Claims**



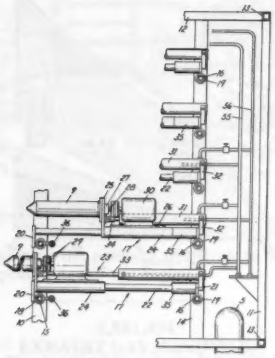
The asparagus stalks are cut at suitable level or height by diamond or triangular teeth formed on a thin knife blade in which the inclined edges of the teeth are sharpened from beneath the blade only leaving a flat planar upper surface of the blade as a support for the severed stalks as the inclined teeth cut through same, the thin knife blade being affixed for support and substantial rigidity to a rigid bar which is supported only at its end portions by linkages which compel a species of horizontal oscillating movement of the bar and supported blade compounded of a transverse cutting stroke and simultaneous forward and rearward movements of the teeth by which the inclined edges of said teeth are shifted forwardly and rearwardly while being reciprocated laterally, means being provided in connection with one linkage at least to automatically supply such composite motion incident to the movement of the harvester through the field, while a blast of air directed rearward against the forward surfaces of the asparagus stalks holds the stalks to the line for efficient and clean cutting thus preserving the stalks in prime condition for command of highest prices in the commercial market, the air blast serving also to remove the severed stalks to a conveyor or other means by which the stalks are finally evacuated to a suitable destination.

3,581,484
MACHINE FOR REPEAT HARVESTING CUCUMBERS
Lloyd Gilbert, Ravenna, Mich. 49451
Filed Nov. 22, 1968, Ser. No. 778,206
Int. Cl. A01d *45/00*
U.S. Cl. 56—327 **15 Claims**



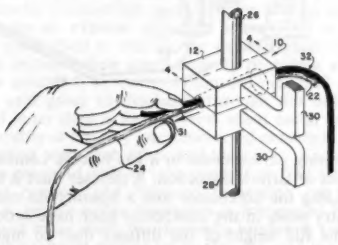
A machine constructed to move a picking mechanism underneath rooted cucumber vines, and remove the cucumbers in excess of a selected size through a rotary grasping action. The vines are repositioned on the ground undamaged as the machine proceeds along a row.

3,581,485
VIBRATORY HARVESTER WITH ALTERNATELY ACTUATED VIBRATORY FINGERS
Horace E. McKibben, Grand Junction, Mich., assignor to Blueberry Equipment, Inc., South Haven, Mich.
Filed Aug. 23, 1968, Ser. No. 754,905
Int. Cl. A01g 19/00
U.S. Cl. 56—330 8 Claims



A row-straddling carriage has sets of individually vibrated fingers mounted on each side. Each set is reciprocable horizontally to penetrate into the crop and is slidable longitudinally of the carriage, against a spring load to remain in contact with the crop as the carriage advances. A system of hydraulic controls effects alternate advance of adjacent and opposed sets of fingers so that each set penetrates the crop while the carriage advances a short distance.

3,581,486
SPLICING OF MULTIFILAMENT STRANDS BY TURBULENT GASEOUS FLUID
Merton L. Dibble, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 1, 1968, Ser. No. 772,679
Int. Cl. D01h 15/00
U.S. Cl. 57—22 11 Claims

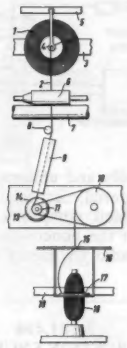


Method, article of the method and apparatus for practicing the method by which overlapped strands of multifilament material are spliced together by a turbulent gaseous fluid with the resulting splice being about at least 80 percent of the strength of one of the unspliced strands and being only slightly increased in cross-sectional size than that of an unspliced strand; the splice being characterized by a false interweaving.

ERRATUM

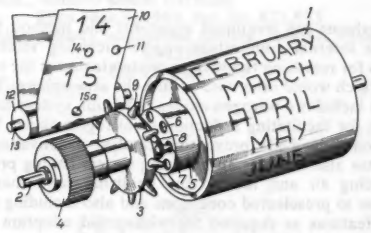
For Class 57—34 see:
Patent No. 3,581,455

3,581,487
YARN DRAWING MACHINE
William Charles Loomes, Arthur James Marrs, both of Derby, and Peter Heffernan, Carlisle, Cumberland, all of, England, assignors to Courtaulds Limited, London, England
Filed July 2, 1969, Ser. No. 838,591
Claims priority, application Great Britain, July 16, 1968, 33,769/68
Int. Cl. D02g 1/08, 1/04; D01h 7/92
U.S. Cl. 57—34 8 Claims



A yarn drawing machine draws yarn between a feed roller and a draw roller which has an associated separator roller for spacing the turns of yarn. The separator roller has a flange of which the peripheral surface frictionally contacts the yarn as it passes onto the separator roller initially so as to false twist the yarn; the twist runs back along the yarn to a region in which the yarn is heated. The yarn is thereby given a potential crimp which is realized when the yarn is relaxed.

3,581,488
CALENDAR DEVICES, PARTICULARLY FOR CLOCKS
Maurice Robin, Suresnes, France, assignor to Ste Jaz S.A., Paris, France
Filed Dec. 9, 1969, Ser. No. 883,371
Claims priority, application France, Jan. 13, 1969, 69.00.397
Int. Cl. G04b 19/24
U.S. Cl. 58—4 4 Claims



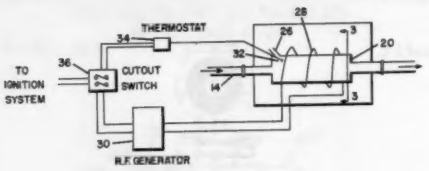
This invention relates to an improved calendar device, particularly for a clock, permitting a drum bearing the indication of the months to be driven from a film bearing the dates which is itself driven by a clockwork movement, wherein it comprises a drum 1 mounted to rotate freely on a shaft 2 and having on one of its side faces holes 6 disposed so as to correspond to the months and in which there may be selectively engaged a boss 7 fixed to the end of a resilient member fast with a wheel 3, mounted to rotate freely on the same shaft as the drum, said wheel having on its periphery spikes 9 which may be selectively engaged in a perforation of the film 10.

3,581,489

APPARATUS FOR INDUCTIVE HEATING NONCONDUCTIVE EXHAUST TREATMENT CATALYST

David L. Camin, Wilmington, and Robert E. Burtner, Wynnwood, Wilmington, both of, Del., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Dec. 17, 1968, Ser. No. 784,352
Int. Cl. F01n 3/14
U.S. Cl. 60—30 2 Claims



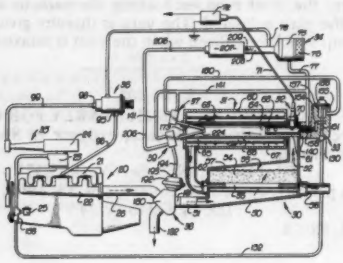
Apparatus for rapidly and uniformly heating nonconductive particulate material, especially exhaust treatment catalyst particles, which comprises dispersing conductive metal particles within the nonconductive material and subsequently inducing radio frequency current into the metal particles.

3,581,490

INTERNAL COMBUSTION ENGINE EXHAUST GAS TREATMENT APPARATUS AND METHOD

Charles W. Morris, 11769 Chenault Street, Los Angeles, Calif.

Filed Apr. 25, 1968, Ser. No. 724,168
Int. Cl. F01n 3/14
U.S. Cl. 60—30 11 Claims



An exhaust gas treatment apparatus and method for use with an internal combustion engine including interrelated systems for removing the various contaminants in the exhaust gases which would otherwise pollute the atmosphere. The apparatus includes a nitrogen oxides reduction system having a catalyst for facilitating reduction of nitrogen oxides by carbon monoxide while preventing catalyst deactivation. The apparatus also includes an oxidizing system having provision for adding air and fuel to the oxidizing zone thereof in response to preselected conditions and also including several safety features as required for widespread adoption of the system in automobiles.

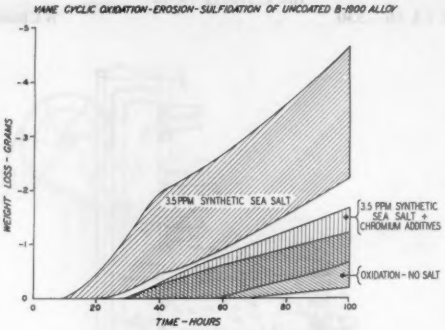
3,581,491

PREVENTION OF HOT CORROSION IN GAS TURBINE ENGINES

Norman S. Bornstein, Middletown, and Michael A. Decrescente, Wethersfield, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Jan. 7, 1969, Ser. No. 789,578
Int. Cl. F02c 7/30
U.S. Cl. 60—39.02 8 Claims

In order to prevent the accelerated sulfidation attack, or hot corrosion, of the nickel-base and cobalt-base alloys in gas turbine engines operating in atmospheres containing sea salt ingredients, the engine is treated with an oxide of chromium, tin, samarium, or columbium whereby the formation of the


VANE CYCLIC OXIDATION-EROSION-SULFIDATION OF UNCOATED B-1900 ALLOY
WEIGHT LOSS - GRAMS
TIME - HOURS
3.5 PPM SYNTHETIC SEA SALT
3.5 PPM SYNTHETIC SEA SALT + CHROMIUM ADDITIVES
OXIDATION - NO SALT

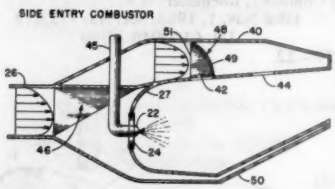
detrimental alkali metal species and consequent corrosion is forestalled.

3,581,492

GAS TURBINE COMBUSTOR

Carl T. Norgren; William H. Roudebush, North Olmsted, and Francis M. Humenik, Parma, Ohio, assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 8, 1969, Ser. No. 839,994
Int. Cl. F02c 3/06
U.S. Cl. 60—39.36 8 Claims



Maintaining performance in a gas turbine combustor during periods of airflow distortion. A diffuser duct is between a liner forming the combustor and a housing surrounding the liner. Entry ports in the combustor liner have scoops which extend the full height of the diffuser duct to maintain the proper airflow distribution regardless of inlet airflow distortion.

3,581,493

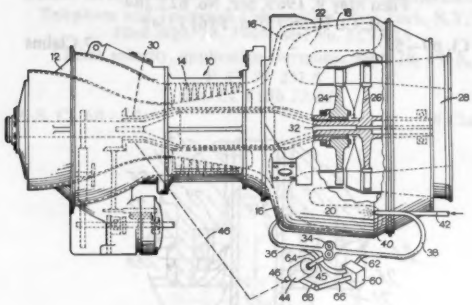
AIR ASSIST FOR FUEL INJECTOR

Ervin J. Sweet, Trumbull, and Paul A. Avery, Shelton, both of, Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Dec. 12, 1969, Ser. No. 884,561
Int. Cl. F02c 9/14
U.S. Cl. 60—39.74 3 Claims

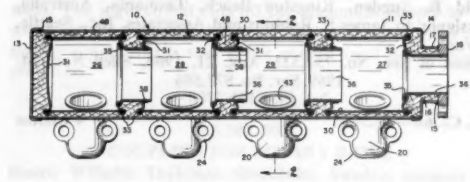
An air assist device for maintaining a constant pressure drop at the point of fuel injection for air supplied to the combustor over the speed range of a gas turbine compressor, the air assist pump being connected between the engine compressor and the fuel injector with the rate of rotation of the pump varied in response to variations in fuel manifold pressure by means of a toroidal type transmission the drive for

which is varied to compensate for changes in the manifold pressure thereby varying the speed of rotation of the pump to



assist in maintaining the pressure of the air to the fuel injector over the speed range of the engine.

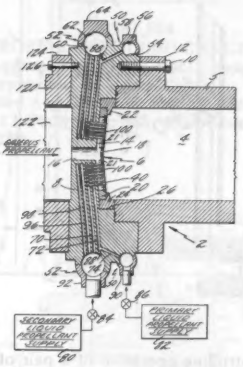
3,581,494
EXHAUST GAS MANIFOLD
George E. Scheitlin, and Frank L. Zagar, Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.
Continuation-in-part of application Ser. No. 785,650, Dec. 20, 1968, now abandoned. This application Jan. 2, 1970, Ser. No. 187
Int. Cl. F01n *3/00*
U.S. Cl. 60—29 **12 Claims**



An exhaust gas manifold for an internal combustion engine in which there is provided an outer shell having a plurality of port runners for connection to said engine and an outlet for connection to an exhaust pipe. An inner shell is carried within the outer shell to receive the exhaust gases from the engine and increase their dwell time by providing adequate volume for oxidation to occur within the manifold prior to permitting said gases to discharge through the outer shell outlet. Said inner shell is formed from sheet metal and comprises a plurality of slidably interconnected chambers in open communication with each other and the outlet. Each of said chambers is provided with an inlet conduit carried within one of the port runners and disposed in sealing engagement therewith. A compressible insulation is interposed between said outer and inner shells for thermally insulating said outer shell from the exhaust gases passing through said inner shell, and for conserving the thermal energy of the exhaust gases.

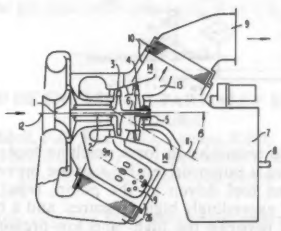
3,581,495
SLOT TUBE SWIRLER INJECTOR
Carl L. C. Kah, Jr., Palm Beach Gardens, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed May 1, 1968, Ser. No. 725,954
Int. Cl. F02g *1/00*
U.S. Cl. 60—39.74 **18 Claims**

An injector assembly has a liquid propellant manifold body on which there are located a plurality of holes of approximately the same depth, first passageways are connected to said holes between the top and the bottom of said holes and second passageways are connected to the bottom of said holes. A slot tube swirler injector or element is inserted and fixed in place in each hole. Each of these swirler elements has two sets of openings for inducing a swirling action along its length, one set of said openings is adjacent the bottom of the element and opens into one of said second passageways and the sec second set of openings opens into one of said first passageways. An injector face plate for gaseous propellant distribution is fixedly spaced a predetermined distance from said manifold body. Said face plate has openings therein and said elements extend into said openings. The openings are spaced from said elements to permit a flow of gas therearound. A first manifold directs a primary liquid flow to said first passageways and a second manifold directs a secon-



dary liquid flow to said second passageways. Control means are provided to give desired primary and secondary flows. A combustion chamber is fixed around the face plate of said injector head and terminates in a nozzle rearwardly thereof. Means are provided for directing a gas to the forward side of said injection means. An opening or openings are provided to permit the gas to be admitted between the manifold body and face plate. In one instance, a cylindrical passageway means is used and in another the injector head is formed having radial spraybars with the openings being located therebetween. In the event throttling is not desired, one set of slots can be used.

3,581,496
ROTATING REGENERATIVE HEAT EXCHANGER
Reiner Eggebrecht, Munich-Karlsfeld, and Josef Hueller, Munich, both of, Germany, assignors to M. A. N. Turbo G.m.b.H., Munich-Allach, Germany
Filed June 9, 1969, Ser. No. 831,553
Claims priority, application Austria, June 12, 1968, A5629/68
Int. Cl. F02c *7/10*
U.S. Cl. 60—39.51 **1 Claim**

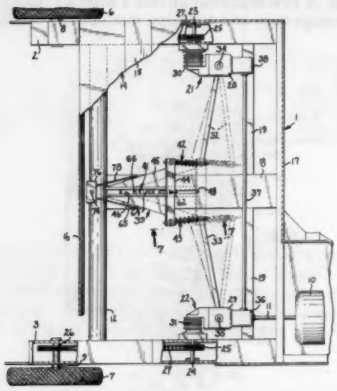


A rotating regenerative heat exchanger for use with a gas turbine engine, whose axis of rotation is inclined to the center longitudinal axis of the gas turbine engine.

3,581,497
CONTROL APPARATUS FOR HYDRAULIC DRIVE MECHANISM

Frank C. Krumholz, Owatonna, Minn., assignor to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Sept. 8, 1969, Ser. No. 856,133
Int. Cl. B62d *11/04*
U.S. Cl. 60—53 8 Claims

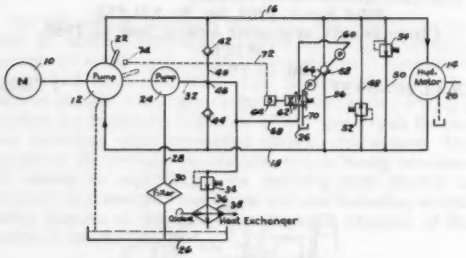


Means for controlling operation of a pair of independent hydraulic drive units for a vehicle, each including a pump and cooperating motor at least one of which is of variable displacement, each unit having a control arm movable to vary said displacement to provide varying forward and rear speeds and a neutral stationary condition of said motors. A control lever is operatively connected to said control arms and is bodily movable by speed control means to control the speed of said motors in common, said control lever being mounted for pivotal movements, imparted thereto by steering means, to differentially control the motors.

3,581,498
HYDROSTATIC TRANSMISSION

Sylvester R. Cudnohufsky, 1290 Lake Angelus Shore Drive, Pontiac, Mich.

Filed Apr. 25, 1969, Ser. No. 819,221
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 6 Claims

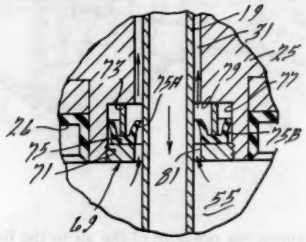


A hydrostatic transmission for a machine tool. The transmission includes a pump driven by a prime mover, a motor for the machine tool driven by the pump, relief valves for "shorting out" exceedingly high pressures, and a bypass conduit extending between the high- and low-pressure sides of the system. A pilot-operated valve in the bypass conduit is adapted to be opened when the pump displacement is reduced to a predetermined low value to equalize the pressure on opposite sides of the motor and thereby cause the motor to stop.

3,581,499
QUICK RAISE ADAPTER

John M. Barosko, Kenosha, Wis., assignor to Tenneco Inc., Houston, Tex.

Filed May 9, 1969, Ser. No. 823,284
Int. Cl. F15b *15/18*; F16j *15/48*
U.S. Cl. 69—52 7 Claims

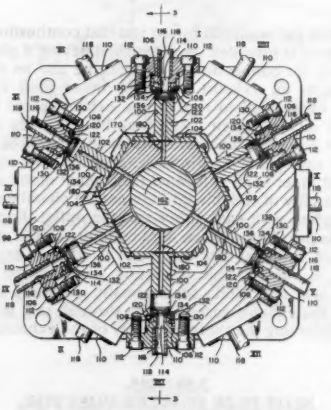


A U-shaped annular cup is disposed in a flow passage between the ram and center tube of a two speed hydraulic jack and acts as a seal during the pumping cycle and as a one-way valve during the release cycle which connects the pressure end of the ram to the reservoir via the center tube.

3,581,500
FLUID PULSE GENERATORS

David B. Sugden, Kingston Beach, Tasmania, Australia, assignor to James S. Robbins and Associates, Inc., Seattle, Wash.

Divison of Ser. No. 754,322, Aug. 21, 1968, Filed Nov. 24, 1969, Ser. No. 877,586
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.5R 4 Claims



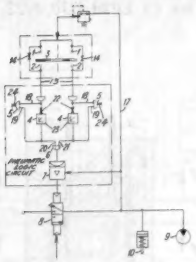
A radial piston type pulse generator divided into two axially spaced sets of radial pistons moved radially by orbiting operator means including separate rotary cams offset on opposite sides of a camshaft. The phase order is staggered so that in the sequence of operation each piston is followed in order by a piston that is substantially diametrically opposite it and which is a piston of the other set.

3,581,501

CONTROL SYSTEM FOR PNEUMATICALLY OPERATED TOOLS

Gunter Kruger, Gifhorn, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 18, 1969, Ser. No. 859,073
Claims priority, application Germany, Sept. 28, 1968, P 17 77 231.5
Int. Cl. F15b *13/02*
U.S. Cl. 60—57 8 Claims



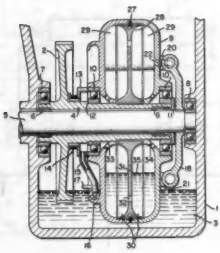
A control for switching off the air supply to a pneumatically operated rotating tool when the tool stops rotating. A pneumatic logic circuit including two free jet nozzles and an interrupter disc rotating with the tool creates a pulse signal when the tool rotates and a continuous signal when the tool stops. The logic circuit cuts off the pneumatic supply to the tool when a continuous signal is sensed, thereby insuring that the air supply to the tool is not cut off until full torque is produced.

3,581,502

COUPLING FOR ROTARY DRIVE

Henric Wilhelm Thylefors, Stockholm, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Sept. 16, 1969, Ser. No. 858,356
Claims priority, application Sweden, Oct. 15, 1968, 13857/1968
Int. Cl. F16h *41/04*
U.S. Cl. 60—54 6 Claims



A rotary housing of the coupling encloses a liquid for transmitting force between driving and driven shafts and is inserted in a gear housing. The coupling is provided with a pump for continuously pumping oil from the gear housing into the coupling housing, and the latter has an outlet for continuously discharging oil to the gear housing.

3,581,503

METHOD OF INCREASING THE LIFE OF GAS BUBBLES

Leslie H. Bernd, Altamont, N.Y., assignor to General Electric Company

Continuation of application Ser. No. 476,516, Aug. 2, 1965, now abandoned. This application June 17, 1968, Ser. No. 747,407
Int. Cl. B63h *11/06;* B64g *9/00;* F03h *5/00;* F23r *1/00*
U.S. Cl. 60—204 3 Claims

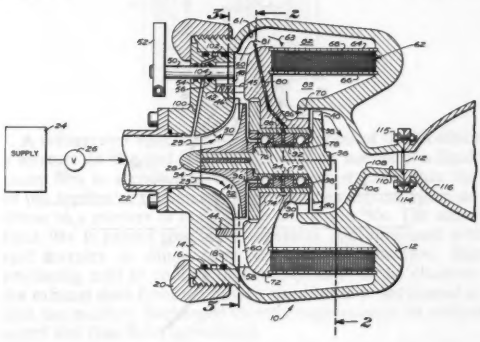
Method for coating bubbles of hot gaseous products being injected into cold liquid medium for propulsion for purposes of prolonging the life thereof and enable optimizing release of the energy of the bubbles.

3,581,504

MONOPROPELLANT TURBO GAS GENERATOR

Stanley R. Andrus, Fair Oaks, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Aug. 28, 1968, Ser. No. 755,948
Int. Cl. F02k *9/02;* B01j *9/04;* F04d *15/00*
U.S. Cl. 60—259 14 Claims



A gas generator according to the present disclosure comprises a housing having an inlet opening for admitting monopropellant into the housing and an outlet having a back pressure control throat for expelling expanded gases therefrom. Impeller means is mounted within the housing for pressurizing the monopropellant. A turbine drive means is rotatably mounted within the housing adjacent the outlet for driving the impeller. Catalyst means is mounted within the housing intermediate the impeller and the turbine for decomposing the monopropellant.

The gas generator operates in a pressure-amplifying staged expansion cycle in that the impeller means increases the pressure of the monopropellant before the monopropellant reaches the catalyst, and the monopropellant decomposes in the presence of the catalyst to produce exhaust gas of relatively high pressure. The gas is expanded in the first stage of expansion to drive the turbine means. The gas may be further expanded through the back pressure control throat to form a second stage of expansion. If desired, the outlet of the back pressure control throat may be contoured to form a divergent nozzle so the gas generator may be used as a turborocket engine.

3,581,505

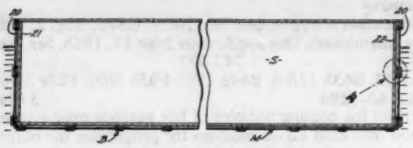
A METHOD OF ENCASING A PARTIALLY SUBMERGED STRUCTURE

Orval E. Liddell, P.O. Box 1533, Avalon, Calif.

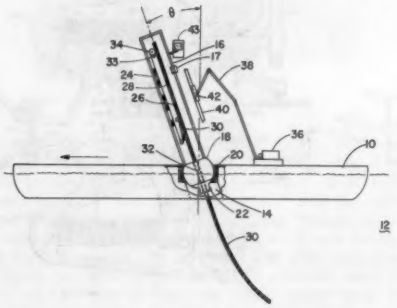
Filed June 27, 1969, Ser. No. 837,259
Int. Cl. B63b *59/00;* E02d *29/00*
U.S. Cl. 61—46 3 Claims

A protective covering for a submerged structure such as a boat, drydock, barge, float, pier, bulk head, and the like. The covering includes a pliable generally waterproof sheet and attachment means for securing spaced portions of the sheet to the surface of the structure to be protected whereby the sheet will resist deterioration of the structure. A novel method of installing the protective covering utilizing a plu-

rality of buoyancy units is disclosed. The use of such buoyancy units permits the covering to be readily maneuvered underneath a floating structure so that the structure may be easily covered in situ.

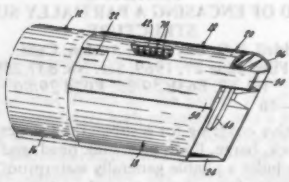


3,581,506
LAYING PIPELINE IN DEEP WATER
George C. Howard, Tulsa, Okla., assignor to Pan American Petroleum Corporation, Tulsa, Okla.
Filed Dec. 31, 1968, Ser. No. 789,034
Int. Cl. F16l *1/00*
U.S. Cl. 61—72.3 **6 Claims**



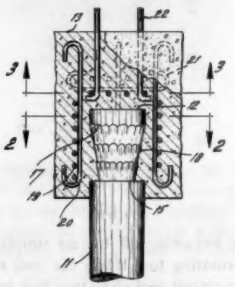
This relates to a system of laying pipeline in deep water from a barge floating thereon. The barge has a vertical passage therethrough. A bearing means supports an elongated frame or rack above said passage and provides for pivotal movement in any direction. The elongated frame supports movable pipe gripping means, and pipe joint making means are supported on an endless belt for continuous operation. The proper restraint applied to the pipe, as the barge moves through the water, automatically provides proper catenary for the pipeline that is being laid. This pivotal system of supporting the elongated frame compensates for roll of the ship as well as pitch of the ship without having additional stress applied to the pipe, which would be the case if the pipe supporting means did not have the pivotal arrangement of this invention.

3,581,507
TUNNELING SHIELD
Richard W. Stevens, Oconomowoc, Wis., assignor to Milwaukee Boiler Manufacturing Company, Milwaukee, Wis.
Filed July 7, 1969, Ser. No. 839,577
Int. Cl. E01g *3/02*
U.S. Cl. 61—85 **7 Claims**



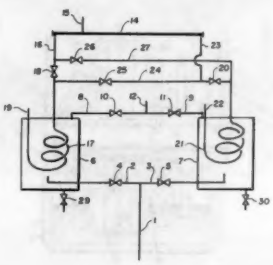
A tunneling shield is provided having a hull section positioned along the bore of the tunnel. The hull section includes a plurality of movable hollow hood segments having closed forward ends mounted around the upper periphery thereof. The hollow hood segments have sufficient beam and columnar strength to resist deflections as the hood segments are moved forward to provide a shield under which excavation may occur. The hood segments are mounted between divider plates having ways or slides for facilitating the movement of the hood segments without deflection.

3,581,508
UPLIFT PILE ANCHORAGE STRUCTURE
Ralph W. Junius, 501 Jewel St., New Orleans, La.
Filed Aug. 18, 1969, Ser. No. 850,803
Int. Cl. E02d *5/30, 5/22*
U.S. Cl. 61—53 **4 Claims**



An uplift pile anchorage structure having a wooden pile with a truncated section cut near the upper end thereof. The upper end of the wooden pile including the truncated section is surrounded by a reinforcing cage and imbedded in a concrete cap. The cap may take form of a large concrete mat having a plurality of such pile structures imbedded therein.

3,581,509
MOISTURE REMOVAL APPARATUS
Dan Paul Manka, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Filed Oct. 27, 1969, Ser. No. 869,817
Int. Cl. F25b *9/02*
U.S. Cl. 62—5 **2 Claims**

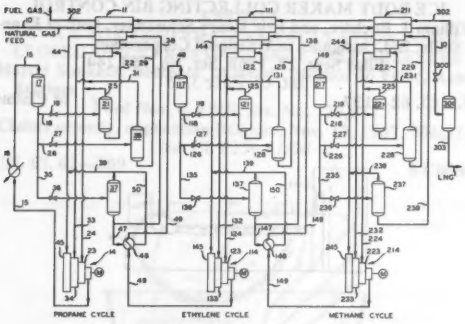


The apparatus comprises a pair of heat exchangers and a vortex tube which provides both hot and cold air from a source of compressed air. The cold air is used on one heat exchanger to freeze the moisture out of the gas and after ice has built up in the heat exchanger hot air is introduced to melt the ice. During this melting period the wet gas and the cold air are passed through the other heat exchanger.

3,581,510
GAS LIQUEFACTION BY REFRIGERATION WITH PARALLEL EXPANSION OF THE REFRIGERANT

James H. Hughes, Bartlesville, Okla., assignor to Phillips Petroleum Company

Continuation of application Ser. No. 510,299, Nov. 29, 1965, now abandoned. This application July 8, 1968, Ser. No. 748,895
Int. Cl. F25j *1/00, 1/02*
U.S. Cl. 62—11 6 Claims

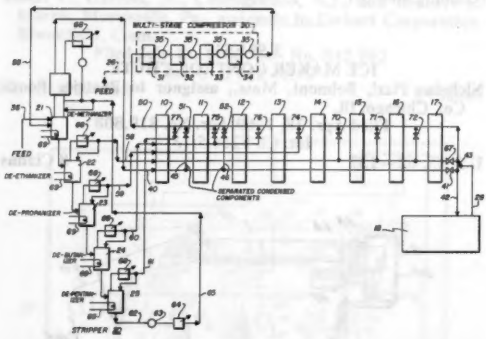


A gaseous feed stream is cooled by a refrigerant which is expanded in parallel portions at different pressures. The lower pressure portion can be used in the same heat exchange zone as the higher pressure portion as well as in its own heat exchange zone. The lower pressure portion can be expanded first to the same pressure as the higher pressure portion and the vapor thus evolved combined with the vapor from the higher pressure portion for compression.

3,581,511
LIQUEFACTION OF NATURAL GAS USING SEPARATED PURE COMPONENTS AS REFRIGERANTS

Ralph E. Peck, Chicago, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of application Ser. No. 770,922, Oct. 28, 1968. This application July 15, 1969, Ser. No. 841,799
Int. Cl. F25j *1/00, 3/00, 3/02*
U.S. Cl. 62—24 10 Claims

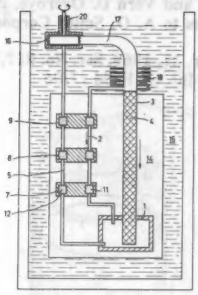


A gas liquefaction system wherein the refrigerant components are mixed with one another and, thereafter, separated into individual streams which enter the system as liquid streams. Cooling is produced by evaporating the cooled liquid component streams into a gas stream, which after all the individual cooled liquid component streams have been evaporated into it, forms the mixed refrigerant component stream returned to the compressor.

3,581,512
LIQUID HELIUM REFRIGERATION APPARATUS AND METHOD

Frans Adrianus Staas, and Adrianus Petrus Severijns, Eindhoven, both of, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed June 2, 1969, Ser. No. 829,332
Claims priority, application Netherlands, June 5, 1968, 6807902
Int. Cl. F25d
U.S. Cl. 62—56 15 Claims

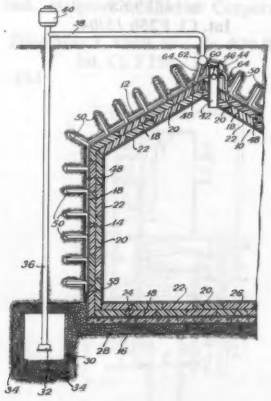


A refrigerator operating below the λ-point of ^4He in which a mixture of ^3He and ^4He is circulated by means of a liquid pump first to a cooler having a temperature lower than that of the λ-point of the mixture producing superfluid ^4He in addition to a mixture of normal ^4He and liquid ^3He. The superfluid ^4He is passed through a superleak and combined with said mixture to dilute same in a mixing chamber, thus producing cold to cool an object disposable in the chamber. An exhaust duct from the mixing chamber is proportioned so that the medium discharged therethrough exceeds its critical speed and thus flows turbulently.

3,581,513
METHOD AND SYSTEM FOR FREEZING ROCK AND SOIL

John L. Jr. Cranmer, Chicago; Bertram E. Eakin, Naperville, Ill., and Eugene P. McCann, Tewksbury, Mass., assignors to Institute of Gas Technology

Continuation-in-part of application Ser. No. 702,293, Feb. 1, 1968, now abandoned. This application Apr. 23, 1969, Ser. No. 818,771
Int. Cl. B65g *5/00*; F17c *7/02*
U.S. Cl. 62—50 15 Claims



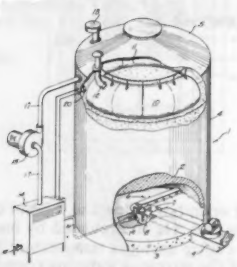
A system and method for freezing water in the rock and/or soil formation surrounding a chamber, at least partially below

ground level, used for storing liquid gas at cryogenic temperatures. Gas boiled from the liquid gas in the chamber is vented and is distributed to a plurality of series connected heat exchangers positioned in the surrounding formation. The cold gas freezes the water in the formation surrounding the heat exchangers to thereby improve the insulating properties of the insulation surrounding the chamber and to ultimately stop any seepage of water around the chamber.

3,581,514
BREATHER SYSTEM FOR SEALED STORAGE STRUCTURE

Frank D. Hamerski, and Vern D. Overbye, both of Milwaukee, Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Apr. 21, 1969, Ser. No. 817,776
Int. Cl. F25d *17/06*
U.S. Cl. 62—93 **4 Claims**

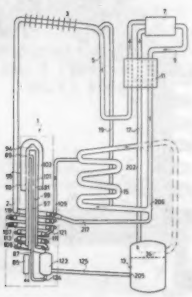


A sealed storage structure such as a silo having a breather system including a flexible breather bag or equivalent pressure-balancing member. To increase the pressure-balancing capacity of the breather system, a gas cooler assembly is provided. Conduit members connect the cooler assembly to the interior of the silo and to a blower unit to provide a closed gas recirculation path. The cooler and blower are controlled by a thermostat switch within the silo, which switch is set to initiate the recirculation operation at a predetermined maximum temperature and to similarly terminate operation at a predetermined minimum temperature.

3,581,515
ABSORPTION REFRIGERATION SYSTEM AND METHOD OF OPERATION THEREOF

Hans Stierlin, Rainweg 15, Schlieren (Katzen, Zurich, Switzerland

Filed Oct. 6, 1969, Ser. No. 870,645
Claims priority, application Switzerland, Oct. 4, 1968, hr14889/68
Int. Cl. F25b *15/04*
U.S. Cl. 62—110 **10 Claims**

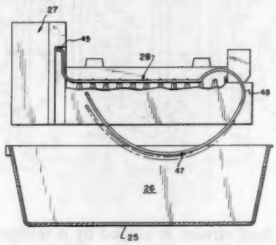


An absorption refrigeration system and a method of operating the same. The system includes a generator, a condenser, an evaporator, an absorber and a reservoir in circuit with each other. Conduit means has two legs through one of which a pressure-equalizing gas circulates in refrigerant-enriched state and through the other of which the same gas circulates in refrigerant-poor state. The refrigerant contained in the reservoir is contacted exclusively with the pressure-equalizing gas in the refrigerant-poor state to prevent the formation of layers of different refrigerant concentration in the refrigerant contained in the reservoir.

3,581,516
ICE BODY MAKER COLLECTING BIN CONTROL

William J. Buchser, and Eric Henry Schwenker, both of Evansville, Ind., assignors to Whirlpool Corporation

Filed Sept. 27, 1968, Ser. No. 763,244
Int. Cl. F25c *5/18*
U.S. Cl. 62—137 **14 Claims**

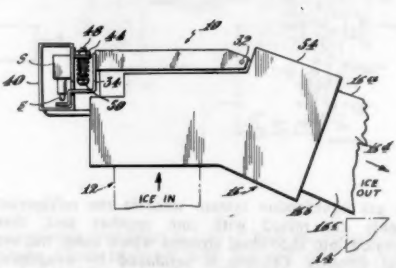


An ice body maker having a mold in which ice bodies are formed with means for ejecting the ice bodies to a collecting bin along a preselected path. A control is provided including a holding means which interrupts the movement of the ice bodies along the ejection path to hold them in spaced relationship to the collecting space, permitting them to dry. During this drying period a sensing portion of the control moves through the collecting space to sense the level of ice bodies therein for automatically maintaining a preset level. During movement of the sensing portion of the control through the collecting space, the holding means prevents the ice bodies being ejected from the mold from falling onto the sensing portion, thereby preventing them from being raked from the bin defining the collecting space by the sensing portion should the bin be removed from the ice body maker. The control is adjustable to permit different preset levels of ice bodies in the collecting space to be obtained as desired. The adjustment of the control may be maintained by means of a retaining member.

3,581,517
ICE MAKER CONTROL CHUTE

Nicholas Pizzi, Belmont, Mass., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Apr. 28, 1969, Ser. No. 819,808
Int. Cl. F25c *5/18*
U.S. Cl. 62—137 **8 Claims**



A control chute supported in an inclined position with one end adjacent an ice-making machine and the other adjacent

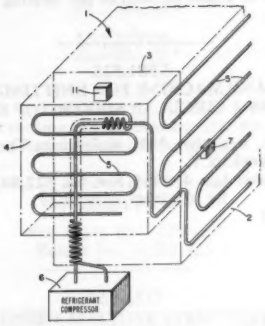
an ice storage bin, comprising a hollow-walled conductor provided with an inlet opening at its upper end and a discharge opening at its lower end, a deflector adjacent the inlet opening for deflecting ice supplied through the inlet opening toward the discharge opening, and a displaceable panel supported above the inlet opening operable, when displaced by ice backing up into the conductor, to operate a switch which in turn will stop the icemaker. Spring means yieldably opposing displacement until a predetermined compaction of the ice takes place in the conductor.

3,581,518

DEVICE FOR TEMPERATURE REGULATION INSIDE CLOSED SPACES PARTICULARLY DEEP-FREEZERS

Marcel Simkens, Beernem, Belgium, assignor to Friac, Aalst, Belgium

Filed Nov. 4, 1968, Ser. No. 773,077
Claims priority, application Belgium, Nov. 10, 1967, 706,314
Int. Cl. F25b *41/00*
U.S. Cl. 62—209 **5 Claims**



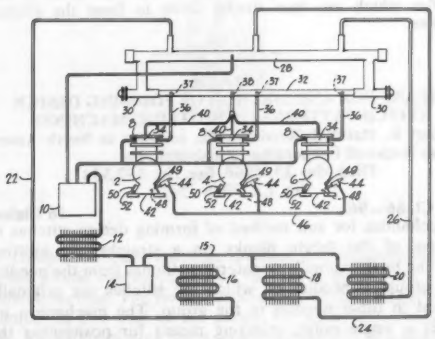
A device for regulating the temperature inside a freezer which has a prefreezing compartment separated by a partition wall. Two thermostats connected in parallel are used, the detection for one being located in the storage compartment and the other in the prefreezing compartment on the partition wall where it is affected only by the temperature of the food introduced into the compartment.

3,581,519

OIL EQUALIZATION SYSTEM

Albert G. Garrett, Jr., Collingswood, N.J., and Herbert R. Morris, Morrisville, Pa., assignors to Emhart Corporation, Bloomfield, Conn.

Filed July 18, 1969, Ser. No. 842,902
Int. Cl. F25b *43/02*
U.S. Cl. 62—468 **5 Claims**



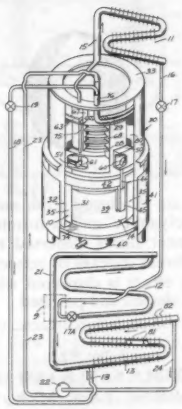
A system for equalizing the level of the oil in each of a plurality of compressors in a refrigeration system wherein each compressor is provided with an oil level equalizer connected to a common oil line and means are provided for substantially uniformly distributing oil returning from the system to each of the compressors.

3,581,520

ABSORPTION REFRIGERATION SYSTEM

August Quesada, Arlington, and Norman D. Malcosky, Columbus, Ohio, assignors to Columbia Gas System Service Corporation, New York, N.Y.

Filed Apr. 9, 1969, Ser. No. 814,636
Int. Cl. F25b *15/04*
U.S. Cl. 62—476 **9 Claims**



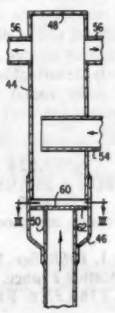
An absorption refrigeration system having a gas-fired, infrared radiant heater, a compact single-unit combined generator, analyzer and rectifier. The unit is formed by concentric cylindrical shells closed at the top and bottom to form an annular space therebetween with the inner wall defining the annular space surrounding the radiant burner. The lower section of the annular space constitutes the generator; the intermediate section contains the analyzer and an associated heat exchanger; and the upper section contains the rectifier. The interior wall of the generator section is uniformly heated by the radiant burner, and the products of combustion also heat the exterior wall of the generator.

3,581,521

REFRIGERANT DISTRIBUTOR FOR AN ABSORPTION REFRIGERATION MACHINE

John P. Eberz, Syracuse, N.Y., and Richard A. English, Indianapolis, Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 1, 1969, Ser. No. 820,755
Int. Cl. F25b *15/04*
U.S. Cl. 62—494 **6 Claims**



An absorption refrigeration system employing a distributor

for mixing refrigerant vapor from the evaporator with strong solution from the generator to provide a mixture thereof to separate circuits of a multicircuit absorber.

3,581,522
POLYBLEND GEMS AND THE LIKE AND METHODS FOR PRODUCING THEM

Robert C. Winckhofer, and Gene C Weedon, both of Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 1, 1968, Ser. No. 725,767
Int. Cl. A44c *17/00*; G02b *5/14*
U.S. Cl. 63—32 **4 Claims**

Artificial gems are produced from matrix-type filaments comprised of a polyamide matrix-forming polymer having micron-sized polyester fibrils dispersed in said matrix. The polymers have different indexes of refraction so that a cat's eye or chatoyancy effect is displayed when these filaments are fused together, shaped and polished.

3,581,523
FLEXIBLE CABLE ASSEMBLY

Donald D. Bartholomew, Utica, Mich., assignor to Merit Plastics, Inc., East Canton, Ohio

Filed Feb. 24, 1969, Ser. No. 801,539
Int. Cl. F16c *1/02*
U.S. Cl. 64—2 **14 Claims**

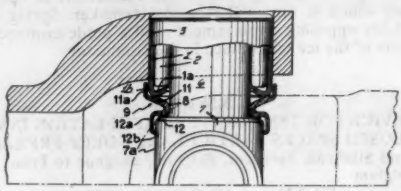
A flexible cable assembly comprising an elongated torque-transmitting shaft or core member, an elongated housing member defining an internal passage adapted to receive and rotatably support the core member, and a liner member interposed between the exterior of the core member and the interior of the housing member, the liner member comprising an annular support section and a plurality of longitudinally extending, circumferentially spaced, radially projecting ribs which are of a relatively deformable and resilient construction and adapted to resist radial movement of the core member toward the housing member upon rotation thereof.

3,581,524
SEALING DEVICE FOR A BEARING MOUNTED ON A SHAFT

Alfred Pitner, Paris, France, assignor to Nadella S. A., Rueil-Malmaison, France

Filed July 1, 1968, Ser. No. 741,441
Claims priority, application France, July 13, 1967, 114230
Int. Cl. F16d *3/26*; F16c *39/06*
U.S. Cl. 64—17 **8 Claims**

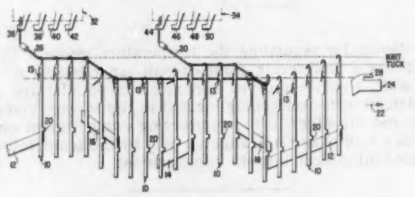
A sealing device is disclosed for sealing the connection between a shaft shoulder and a bearing mounted on the shaft. The device comprises a ring having a nonmetallic surface which has cylindrical or conical flange covering the cylindrical outer face of either or both of the bearing and the shaft shoulder.



3,581,525
METHOD AND MACHINE FOR KNITTING PLAITED FABRIC ON A CIRCULAR SINKER-TOP KNITTING MAHCINE

Alvin Agulnek, Brooklyn, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Apr. 4, 1969, Ser. No. 822,803
Int. Cl. D04b *9/12, 9/34*
U.S. Cl. 66—9 **5 Claims**



The stitches of a plaited fabric are formed on a circular sinker-top knitting machine by first feeding one yarn to the hooks of knitting needles located at the knit level and then drawing the yarn down to sinker-throat level where the yarn is held by sinkers as the needles are raised to tuck level, another yarn being there introduced into the hooks of the needles which are then drawn down to form the plaited stitches.

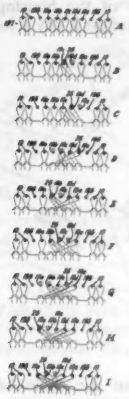
3,581,526
MEANS FOR AND METHOD OF FORMING DESIGN STITCH PATTERNS ON KNITTING MACHINES

Herbert E. Haehnel, Reading, Pa., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed May 23, 1966, Ser. No. 552,334
Int. Cl. D04b *15/04*
U.S. Cl. 66—96 **16 Claims**

Mechanism for and method of forming design stitches in courses of flat fabric blanks on a straight bar knitting machine by individually transferring stitches from the needles of a group of needles on which the stitches are originally formed to other needles in the group. The mechanism includes a single point, selecting means for positioning the point in alignment with each needle of the group, and selectively operated cam means for shifting the point to transfer the stitch from a needle of the group determined by the selecting means to another needle of the group, and for shift-

ing the point from the needle of the group determined by the selecting means into alignment with another needle of the



group and then shifting the point to transfer the stitch on the latter needle to a further needle of the group.

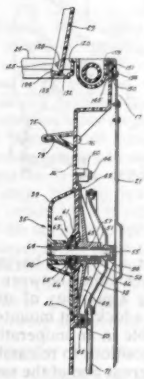
ERRATUM

For Class 66—129 see:
Patent No. 3,581,325

3,581,527
LAUNDRY MACHINE STRUCTURE

Thomas R. Smith; Charles W. Burkland; Edward O. McCartney, and Frank E. Ross, all of Newton, Iowa, assignors to The Maytag Company, Newton, Iowa

Filed Dec. 18, 1969, Ser. No. 886,182
Int. Cl. D06f *29/02*
U.S. Cl. 68—26 **19 Claims**

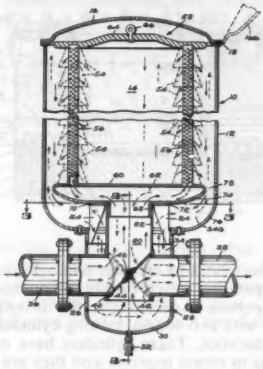


A compact laundry machine includes a two-compartment molded plastic tub supported on the upper metal edge of a cabinet structure. The forces associated with agitating means mounted on one wall of the plastic tub in a first compartment, the spring-biasing force on a seal assembly at a spinner in the second compartment, and the weight of fluid within the two compartments are all carried through the plastic tub to the supporting edge of the cabinet.

3,581,528
REVERSING VALVE

Peder Mortensen, Bagsvaro, Denmark, assignor to Rodney Hunt Company, Orange, Mass.

Filed June 12, 1969, Ser. No. 832,636
Int. Cl. D06f *17/02*
U.S. Cl. 68—189 **8 Claims**

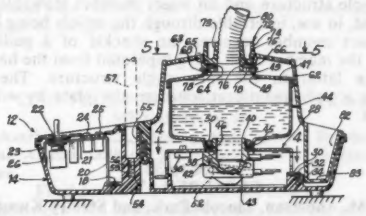


A valve means for reversing the flow of processing fluid through packages of yarn or the like while the packages are mounted on the perforated spindles of a conventional carrier, the latter in turn being contained in a kier or other like treatment vessel. The valve means includes a valve chamber centrally located at the base of the kier. The valve chamber is surrounded by the radially spaced wall of a valve housing and the relationship of these components is such that the upper and lower ends of the valve chamber are in communication respectively with the perforated carrier spindles and the valve housing. The valve housing is in turn in communication with the interior of the kier. Inlet and outlet conduits for the processing fluid extend through the wall of the valve housing into communication with the valve chamber, and a butterfly valve in the valve chamber is adjustable to place the inlet conduit in communication with either the upper or lower end of the valve chamber.

3,581,529
STEAMER

Bernard A. Mitchell, 33 N. LaSalle St., Chicago, Ill.; Victor A. Petertil, Oak Park, and James Teague, Chicago, Ill., assignors to Mitchell, by said Petertil and Teague

Filed Mar. 17, 1969, Ser. No. 807,729
Int. Cl. D06f *71/34*; F22b *1/28*
U.S. Cl. 68—222 **12 Claims**

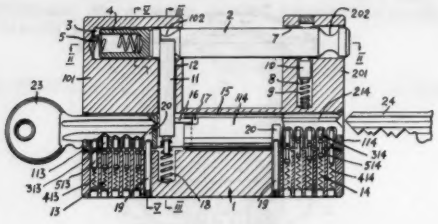


A steamer for use as a household appliance which produces steam and exhausts same through a nozzle on the end of a flexible conduit so that the steam may be directed against clothes, drapes, and the like, to remove wrinkles therefrom and to serve as a freshener therefor.

3,581,530
CYLINDER PADLOCKS

Giancarlo Raspadori, 36, Via Torchi, Massa Lombarda (Ravenna), Italy

Filed Nov. 12, 1968, Ser. No. 774,838
Claims priority, application Italy, Nov. 18, 1967, 7437 A/67
Int. Cl. E05b *67/24, 35/12*
U.S. Cl. 70—38 3 Claims

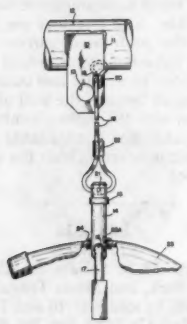


This invention relates to cylinder padlocks, and has for an object such a padlock which cannot be opened by a single key and one person. Accordingly, the invention provides such a padlock with two coaxial locking cylinders of differing locking characteristics. These cylinders have cores that are connected so as to rotate together and they are coupled to a latching bar for locking a shackle for the padlock.

3,581,531
LOCKING DEVICE FOR A MOTORCYCLE HELMET

Richard L. Hediger, P. O. Box 1051, Springfield, Oreg.

Filed July 14, 1969, Ser. No. 841,402
Int. Cl. E05b *73/00*
U.S. Cl. 70—59 3 Claims



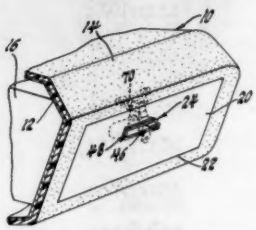
A locking device for securing articles such as safety helmets to motorcycles and including a plate mounted on the motorcycle structure and an insert member stowable in the plate and, in use, insertable through the article being locked. The insert member receives the shackle of a padlock to prevent the member from being separated from the helmet to lock the latter to the motorcycle structure. The insert member is permanently attached to the plate by a flexible member.

3,581,532
CLOSURE LATCH

Robert M. Andersen, Lincoln Park, and Stanley Kwasiborski, Jr., Hazel Park, both of, Mich., assignors to General Motors Corporation,, Detroit, Mich.

Filed Apr. 30, 1969, Ser. No. 820,499
Int. Cl. E05b *65/12, 65/44*
U.S. Cl. 70—84 10 Claims

A closure latch includes a housing in which is slidably mounted a slide assembly including a side-bar-type lock cylinder. The slide assembly is bodily shiftable, transversely of the path of movement of a latch bolt, between locked, unlocked, and unlatched positions. When the slide assembly is in the locked and unlocked positions, the end of the lock cylinder blocks movement of the bolt to unlatched position. Also in these positions, the side bar of the lock cylinder cooperates with a rib of the housing to block movement between the positions unless a key is inserted. When the slide

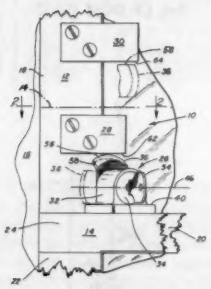


assembly is moved to the unlatched position, the lock cylinder permits the bolt to move to unlatched position. The bolt blocks movement of the slide assembly to unlocked position while in unlatched position by engagement with the side of the lock cylinder, and a coil spring seated between the slide assembly and housing provides a biasing force for automatically returning the slide assembly to unlocked position when the bolt moves to latched position.

3,581,533
WINDOW LOCK

Merton S. Williams, Terryville, Conn., assignor to Emhart Corporation,, Bloomfield, Conn.

Filed Mar. 5, 1969, Ser. No. 804,607
Int. Cl. E05b *65/08;* E05c *3/04;* E05f *5/00*
U.S. Cl. 70—90 15 Claims



A locking device for a window having double-hung sash movable relative to each other between opened and closed positions and including a plurality of strike plates mounted on one of the sash and a lock unit mounted on the other sash. The lock unit is lockable in an inoperative position and in a plurality of operative positions to releasably retain the sash in closed position or to permit one of the sash to be moved freely relatively to the other sash between closed and partially opened positions.

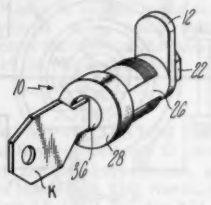
3,581,534
CHANGEABLE COMBINATION CYLINDER LOCK

Frank J. Testa, 531 Mill St., Southington, Conn.

Filed Feb. 9, 1970, Ser. No. 746
Int. Cl. E05b *25/00, 28/10*
U.S. Cl. 70—383 10 Claims

A cylinder lock in which the tumbler assemblies can be rotated with respect to one another by means of a combina-

tion-change key to change the combination of the lock for various unlocking keys. The tumbler assemblies have mating



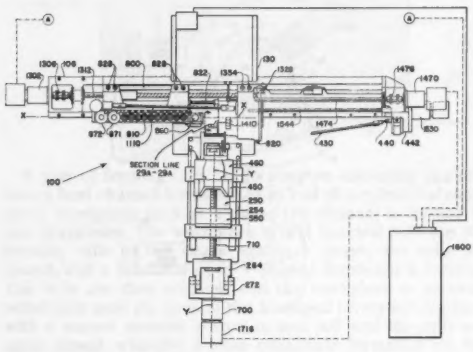
cam projections and recesses whereby the assemblies can be positioned and rotated with respect to each other.

3,581,535

METHOD AND APPARATUS FOR MAKING BLADES

William L. Hinks, and Harry L. Hosterman, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 11, 1968, Ser. No. 744,120
Int. Cl. B21d *11/02, 11/04, 31/00, 43/02, 11/20, 11/22*
U.S. Cl. 72—7 **35 Claims**



Method and apparatus for making blades for use in tire molds by piercing, notching, bending or otherwise altering shape of a free end of strip material by successively positioning the free end and a plurality of shape altering tools in operative engagement and cutting off a so-formed blade from the free end. Apparatus includes an automated machine tool having five axes of control and means for storing and for communicating command signals to each axis. Successive different blade configurations are made without revision of shaping tools. The strip, held by jaws, may be bent up or down in successive bends by a rotating bending device. A rotatable punch and die set is included.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

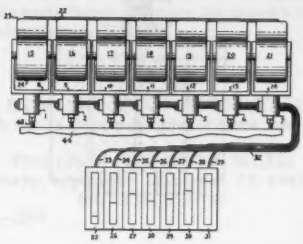
3,581,536

APPARATUS FOR SENSING THE UNSTRESSED SHAPE OF A THIN STRIP SUBJECTED TO HIGH TENSILE STRESS

George E. Terwilliger, Schenectady, N.Y., assignor to General Electric Company

Division of Ser. No. 750,676, July 8, 1968, abandoned, Continuation of Ser. No. 506,984, Nov. 9, 1965, abandoned. This application Apr. 17, 1969 Ser. No. 835,844
Int. Cl. B21b *37/06*
U.S. Cl. 72—9 **3 Claims**

A cold rolling mill is described wherein the unstressed shape of metal sheet is continuously sensed during rolling by a plurality of negligible displacement force sensors perpendicularly disposed relative to the pass line at a mill location producing a tensile stress above 4,000 p.s.i. in the metal sheet being rolled. The output signals from those sensors underlying opposite edges of the metal sheet are compared to



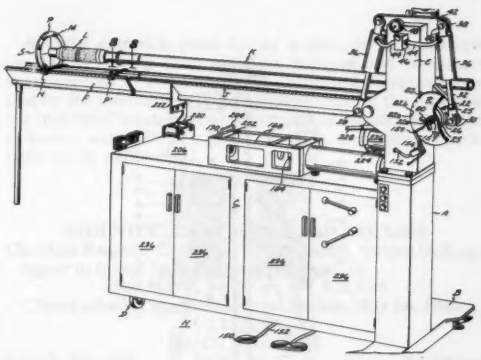
equalize reduction at the sheet edges while the difference between the force measured by a centrally situated sensor and the average force measured by the sensors underlying opposite edges of the sheet provide a signal indicative of the roll bending force required to produce flat sheet.

3,581,537

PIPE BENDER AND SWAGER

Bruce J. Lance, 1460 Chase Drive, Corona, and Richard W. Beall, Jr., 500 Poinsettia, Manhattan Beach, both of, Calif.

Filed Oct. 18, 1968, Ser. No. 768,839
Int. Cl. B21c *51/00*
U.S. Cl. 72—32 **10 Claims**



An improved, manually operable apparatus for forming a sequence of bends of predetermined longitudinal and circumferential spacing in a length of straight tubing by matching first and second insignia to provide a replacement automotive exhaust pipe, and to also permit enlargement of an end of the pipe by swaging.

3,581,538

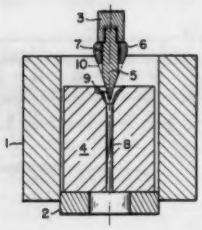
PIERCING TOOL FOR THE PIERCING OF LARGE METAL BLOCKS

Akira Asari, Asahi-Ku, Osaka, and Yuzuru Iimuro, Okuradani, Akashi, both of, Japan, assignors to Cefilac, Paris, France

Filed June 17, 1969, Ser. No. 834,129
Claims priority, application France, June 26, 1968, 156,574
Int. Cl. B21b *45/02, 31/02*
U.S. Cl. 72—43 **4 Claims**

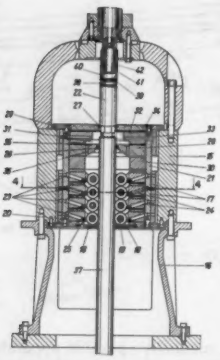
A piercing tool for piercing holes in large metal blocks comprising two distinct members. The shaft transmitting to the tool the force of the piercing press has rigidly secured and axially aligned to its end an axial member of smaller diameter than the shaft. A ring-shaped member having a diameter equal to that of the hole to be formed is annularly

positioned about the axial member and is detachably mounted to the assembly made up of the shaft and axial



member. After the hole has been pierced, the ring-shaped member is detached from that assembly as the tool is withdrawn through the hole in the metal billet.

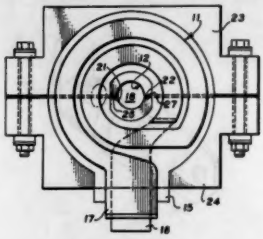
3,581,539
METHOD AND DEVICE FOR DRAWING METAL CUPS TO CAN BODIES
Wilhelm Friedrich Lauener, Langenhard, Switzerland, assignor to Prolizenz AG, Chur, Switzerland
Filed Sept. 9, 1968, Ser. No. 758,389
Claims priority, application Switzerland, Sept. 7, 1967, 12504/67
Int. Cl. B21b *45/02, 17/02;* **B21d** *22/28*
U.S. Cl. 72—45 **7 Claims**



A method for drawing metal cups to can bodies has the steps of drawing the cups through several roll collars while spraying a lubricant in such a way that it lubricates the roll surfaces, the can body and the roll bearings, and also cools, and flushes fine substances. The device for the method has roll collars, a mandrel, ducts connected to a source of lubricant, and orifices for directing the lubricant in spray jets.

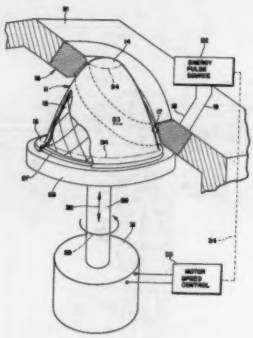
3,581,540
INDUCTIVE DEVICE
Paul Wildi, San Diego, Calif., assignor to Gulf Energy & Environmental Systems, Inc., San Diego, Calif.
Filed Feb. 10, 1969, Ser. No. 797,748
Int. Cl. B21d *26/14*
U.S. Cl. 72—56 **5 Claims**

An inductive device is described such as may be utilized as a coil assembly in magnetic forming apparatus. Force exerted on a damage susceptible region of a primary conductor, as a result of magnetic pressure between the primary conductor and an adjacent secondary conductor, is relieved by an elec-



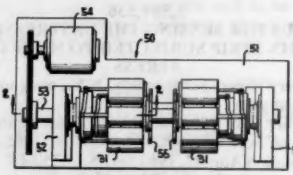
trically floating magnetic shield disposed adjacent the damage susceptible region.

3,581,541
METHOD AND APPARATUS FOR MAGNETIC FORMING
Paul Wildi, San Diego, Calif., assignor to Gulf Energy & Environmental Systems, Inc., San Diego, Calif.
Filed Apr. 1, 1969, Ser. No. 812,129
Int. Cl. B21d *26/14*
U.S. Cl. 72—56 **9 Claims**



A method and apparatus are described for magnetically forming a workpiece. A magnetic field is repetitively produced, the field being of a size for forming the workpiece in a subregion which is substantially smaller than the total region to be formed. The workpiece and the means producing the magnetic field are displaced relatively an amount which provides full coverage of the total region to be formed after a series of repetitions of the magnetic field.

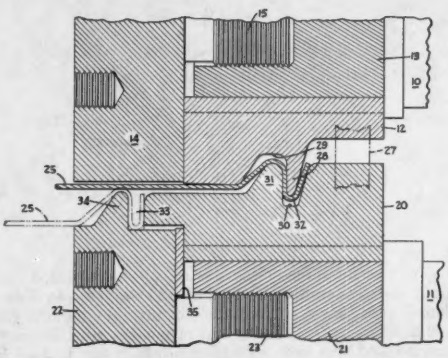
3,581,542
APPARATUS FOR AND METHOD OF NECKING IN END PORTIONS OF TUBULAR MEMBERS
Richard O. Wahler, Rolling Meadows, and Albert J. Holk, Frankfort, both of, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Feb. 3, 1969, Ser. No. 796,013
Int. Cl. B21 *41/04*
U.S. Cl. 72—94 **10 Claims**



This disclosure relates to apparatus for and method of necking in one or both end portions of tubular members. The

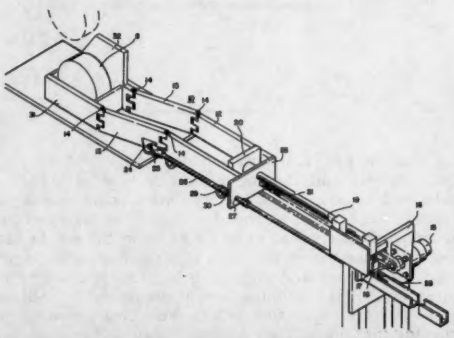
disclosure particularly pertains to the necking in of tubular members which have internal surfaces which may be readily scratched by relative movement between the tubular member and the die center. Accordingly, a suitable die assembly is provided wherein it may be utilized in the necking in of a tubular member without there being relative movement between the die center thereof and the tubular member during the necking in of the tubular member.

3,581,543
ROLL FORMING APPARATUS FOR SHEET METAL
Lawrence L. Hock, Snyder; Clarence O. Jones, Jr., Eggertsville, and Henry Kardas, Lackawanna, all of, N.Y., assignors to Niagara Machine & Tool Works, Buffalo, N.Y.
Filed June 23, 1969, Ser. No. 835,406
Int. Cl. B21d *15/04;* **B23p** *19/04*
U.S. Cl. 72—105 **7 Claims**



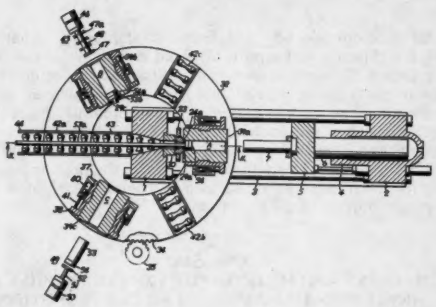
A pair of forming rolls for forming an outwardly opening return bent channel formation at an end of a cylindrical sheet metal workpiece such as a duct. The channel is formed in two operations. The workpiece is first inserted between the forming rolls to full depth against a gauge, the rolls are closed, and a relatively open V-shaped formation is formed. The rolls are then released and the workpiece is partially withdrawn until the apex of the V-shaped formation registers with a narrow annular groove in one roll and the rolls are again closed, whereby a plain cylindrical formation on the other roll engages the outer ends of the V formation and forces the same into the annular groove to complete a relatively narrow U-shaped return bent formation.

3,581,544
MECHANISM FOR RETRIEVING A DUMMY BLOCK FROM AN EXTRUSION PRESS
Andrew J. Grimes, Phoenix, Ariz., assignor to Reynolds Metals Company, Richmond, Va.
Filed Sept. 27, 1968, Ser. No. 763,120
Int. Cl. B21c *23/00*
U.S. Cl. 72—253 **7 Claims**



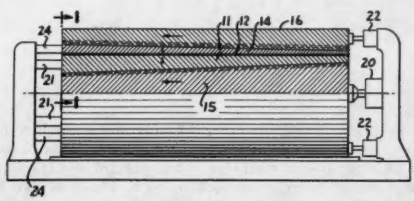
Mechanism for receiving a dummy block from an extrusion press comprising a retriever for receiving the dummy block when the press is opened at the completion of an extruding operation, means for projecting the retriever transversely of the press axis inwardly of the press to a position below the dummy block so that the dummy block may fall into the retriever after the extrusion press is opened and means for retracting the retriever transversely of the press axis outwardly of the press thereby carrying the dummy block with it to a processing station.

3,581,545
METAL EXTRUSION PRESS OF TURNTABLE TYPE
Akira Asari, Osaka, Japan, assignor to Kobe Steel Ltd., Kobe, Japan
Filed Feb. 1, 1968, Ser. No. 702,320
Claims priority, application Japan, Feb. 15, 1967, 42/9994
Int. Cl. B21c *23/00*
U.S. Cl. 72—263 **10 Claims**



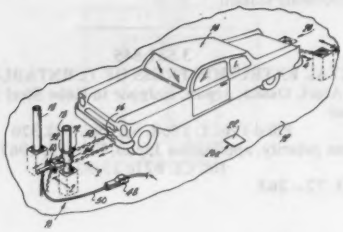
A metal extrusion press having a plurality of containers capable of having their positions changed, the containers being secured to a turntable and distributed therearound so that by the intermittent revolving movement of the turntable the individual containers are successively transferred to the extrusion station from stations in which preparatory operations can be performed.

3,581,546
DEDENTING CONTAINERS AND THE LIKE
Christain Ragettli, Gockhausen near Zurich, Switzerland, assignor to Inland Steel Company, Chicago, Ill.
Filed May 7, 1969, Ser. No. 822,614
Claims priority, application Great Britain, May 14, 1968, 22931/68
Int. Cl. B21d *39/08*
U.S. Cl. 72—355 **11 Claims**



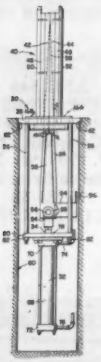
Method and apparatus are provided for removing dents and for reducing asymmetrical stresses in thin wall metal cylinders of the types used in containers or the like. The cylinder is expanded radially to an extent sufficient to exceed the yield point of the metal in tension so as to plastically deform the metal to remove dents, and thereafter the cylinder is compressed radially, while confining the cylinder wall to avoid buckling, to an extent sufficient to exceed the yield point of the metal in compression. By regulating the extent of compression, resilient expansion when the compressive force is withdrawn restores the diameter to substantially the diameter of the original cylinder.

3,581,547
AUTOMOBILE BODY AND FRAME STRAIGHTENING APPARATUS
Fernando Estigarribia, 219-55 74th Ave., Bayside, N.Y.
Filed June 25, 1968, Ser. No. 739,864
Int. Cl. B21d *1/14*
U.S. Cl. 72—453 **1 Claim**



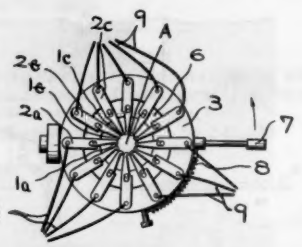
An automobile body and frame straightening apparatus which includes a post removably fixed in a sleeve in the floor of a garage. Six such sleeves make up the total assembly, with similar posts being placed into the various sleeves, as is desired, around the perimeter of the automobile. Each post carries a collar and each collar carries a chain retainer. A chain is run from the retainer to a portion of the automobile and the retainer is hydraulically shifted on the post, moving it and its chain away from the post to thereby straighten any damaged portion of the automobile.

3,581,548
MACHINE AND METHOD FOR EXPANDING SHEET METAL PIPE TO NONCIRCULAR CROSS SECTION
Evan Lilygren, Westerville, Ohio, assignor to United McGill Corporation, Columbus, Ohio
Filed Oct. 3, 1968, Ser. No. 764,783
Int. Cl. B21d *39/08*
U.S. Cl. 72—370 **20 Claims**



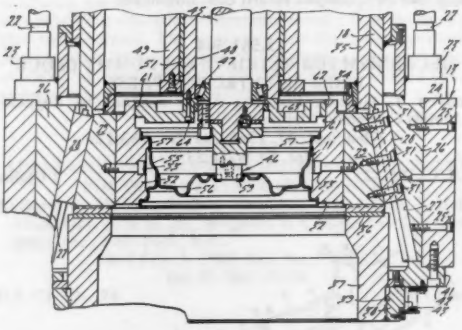
A method of expanding or stretching and a machine to expand or stretch sheet metal pipe into flat oval cross section pipe as well as the resulting length of small diameter expanded, noncircular cross section pipe. The machine has a vertical operating wedge reciprocably disposed between inclined expansion track and mandrel assemblies over which sections of initially round pipe are placed. Power components for the machine are under the working parts and are preferably located below ground level. The method of operation results in expansion of a length of sheet metal pipe up to twice the length of the expansion mandrels into flat oval cross section. The pipe is placed over the mandrels and at least one-half its length stretched, the pipe then being reversed with its other end placed over the mandrels, properly located and stretched in coextensive relationship to the other previously stretched portion of the pipe. The wedge is reciprocated by a hydraulic motor (ram), the inclined tracks are guided for lateral displacement at their lower ends and, by cooperating linkage, will be positively slid back into juxtaposition when the wedge is withdrawn to a retracted position.

3,581,549
DEVICE FOR SPREADING LEAD WIRES OF AN INTEGRATED CIRCUIT MOUNTING STEM
Kiyonori Nakamura, Kawasaki, and Satoru Mochida, Yokohama, both of, Japan, assignors to Fuji Electronics Co., Ltd.,, Kawasaki, Japan
Filed Dec. 5, 1968, Ser. No. 781,504
Claims priority, application Japan, Feb. 6, 1968, Mar. 13, 1968 43/6891 43/15904
Int. Cl. B21d *41/00*
U.S. Cl. 72—399 **5 Claims**



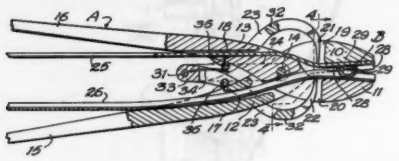
A device for spreading lead wires of an integrated circuit mounting stem comprising hooked bars formed with hooks at their forward ends, a fixed member pivotally mounting said hooked bars at their bases, and means for pivotally moving said hooked bars from a position in which said hooked bars are mounted radially with said hooks at their forward ends forming a relatively small circle into a position in which said hooks form a relatively large circle.

3,581,550
WHEEL ROUNDING MACHINE
Daniel E. Waterbury, Saline, Mich., assignor to Kelsey-Hayes Company
Filed Oct. 22, 1968, Ser. No. 769,626
Int. Cl. B21d *41/00*
U.S. Cl. 72—402 **5 Claims**



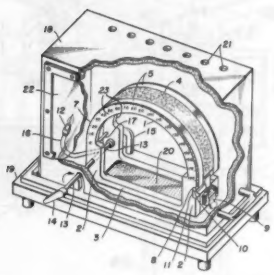
A machine for rounding assembled wheels and for accurately forming and aligning a locating hole in the wheel spider with relation to the rim. The machine includes a plurality of radially movable rounding dies for engagement with the rim of the assembled wheel for rounding the rim. In addition, a forming tool in the form of a rotating cutter is provided for forming and aligning a locating opening in the wheel spider. The forming tool is supported by aligning means that are engageable with the rounding dies when the rounding dies are in their rounding position for accurately locating the forming tool with respect to these rounding dies.

3,581,551
SURGICAL CLAMP APPARATUS
Jack E. Wilkinson, 2411 Divisadero St., Fresno, Calif.
Filed July 22, 1968, Ser. No. 746,338
Int. Cl. B21d *9/08*
U.S. Cl. 72—410 4 Claims



A surgical clamp for closing off blood vessels and the like, in the form of a small self-locking clip, and an applicator in which a series of such clips can be fed into position between a pair of jaws adapted to close and lock the clip around a blood vessel or the like, in constricting relation thereto.

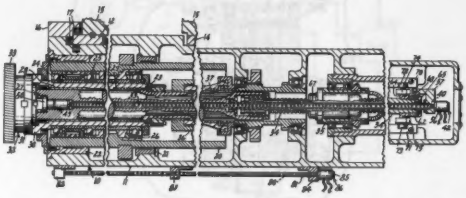
3,581,552
METHOD OF TESTING FLAMMABILITY OF FIBERS
Eugene L. Ringwald, Cary; Mitchell T. Burden, Apex, and Henry L. King, Cary, all of, N.C., assignors to Monsanto Company, St. Louis, Mo.
Filed Oct. 29, 1968, Ser. No. 771,406
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 9 Claims



Flammable fibers are blended and/or twisted with fibers which are substantially less flammable and of relatively high melting point, and subsequently knit or woven into a fabric. The fabric is stretched across and along a semicircular bifurcated nonflammable frame, and ignited on one end. Burning characteristics of the fibers being tested can then be observed without the adverse burn—irregularity otherwise caused by melting or shrinkage of the fibers away from heat and flame.

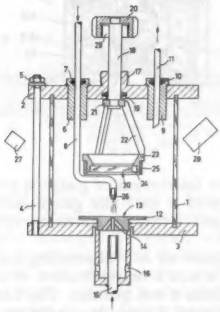
3,581,553
HEAT EXPANSION DETERMINING MEANS
Lewis A. Dever, Cincinnati, Ohio, assignor to The Cincinnati Milling Machine Co., Cincinnati, Ohio
Filed Nov. 14, 1968, Ser. No. 775,702
Int. Cl. G01n *1/00*
U.S. Cl. 73—16 14 Claims

Separate means measure the expansions in opposite directions of a spindle and its carrier housing due to heat. Comparison of the outputs of the two measuring means provides a signal indicative of the total amount of movement of



the cutting tool on the spindle from a reference position due to heat expansion.

3,581,554
DEVICE FOR IDENTIFYING CONDENSATION DEPOSITS
Rene LaFitte, and Paul LeCarpentier, both of Caen Calvados, France, assignors to U. S. Philips Corporation, New York, N.Y.
Filed May 20, 1969, Ser. No. 826,222
Claims priority, application France, May 22, 1968, 152777
Int. Cl. G01n *25/02*
U.S. Cl. 73—17 7 Claims

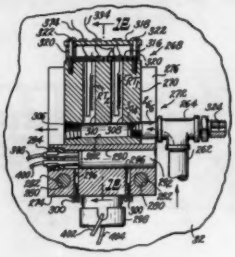


A device for identifying condensation deposits by the measurement of phase transition temperature of deposits on a polished surface having a controllable temperature inside a space traversed by the gas containing the element to be identified. A chamber to contain the gas is formed by the polished surface, a transparent surface arranged parallel to the polished surface and the inner wall of a ring located between the surfaces, means are provided for measuring the temperature of the polished surface so as to determine the transition temperature.

3,581,555
APPARATUS AND METHOD FOR ANALYZING ENGINE EXHAUST GAS
Edwin L. Cline, Pasadena, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.
Filed Oct. 4, 1965, Ser. No. 492,473
Int. Cl. G01n *25/18, 31/00, 33/22*
U.S. Cl. 73—27 20 Claims

A method and apparatus for analyzing engine exhaust or other gas wherein the gas is continuously collected and mixed with a predetermined volume of water to cool the gas to a uniform temperature and to wash contaminants

therefrom, and wherein the mixture is centrifuged and the thus treated gas is caused to flow in a continuous stream to a



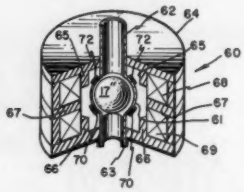
gas analyzer containing a heated filament for measurement of the thermal conductivity of the gas.

3,581,556

DENSITY MEASURING INSTRUMENT

Richard J. Salvinski, Hacienda Heights, and Owen O. Fiet, Redondo Beach, both of, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 26, 1969, Ser. No. 802,403
Int. Cl. G01n *9/20, 11/10;* **G01p** *15/02*
U.S. Cl. 73—30 **4 Claims**



A high precision instrument or gauge is provided for measuring the density of a gas. The gauge includes a buoyant sensing member and forms an active portion of an electric feedback circuit.

The circuit includes an AC (alternating current) bridge the output voltage of which is representative of a deviation of the sensing member from a null position. The bridge output voltage is used to control a restoring force current or electric field used to restore the sensing member to its null position. The feedback voltage or current is a measure of the buoyant force or density of the gas.

The gauge, in one of its preferred embodiments, includes a hollow, magnetic, current conducting sphere which is buoyant when placed in a gas or gaseous mixture whose density is to be measured. The sensing member is magnetically suspended within the field of a differential electromagnet. The position of the sensing member within the magnetic field may be adjusted by changing the current to the electromagnet coils. Similarly, if the disturbance causes the sensing member to move from a null position, an appropriate change in the coil current will restore the sensing member to the null position. The coil current is controlled by the servosystem feedback voltage.

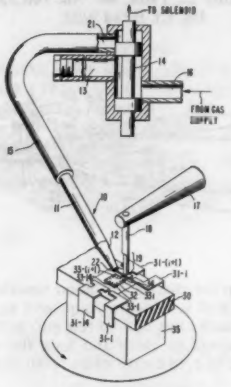
3,581,557

PNEUMATIC LEADWIRE BOND TESTER

Joe Drees, Saratoga, and Suvrat Kirtikar, Stanford, both of, Calif., assignors to Fairchild Camera and Instrument Corporation, Mt. View, Calif.

Filed Aug. 18, 1969, Ser. No. 850,760
Int. Cl. G01m *3/02*
U.S. Cl. 73—37 **14 Claims**

The strength of the two bonds between a leadwire, a semiconductor die and a corresponding semiconductor package lead is tested by passing a selected duration pulse of a gas past the leadwire so as to create drag forces on the



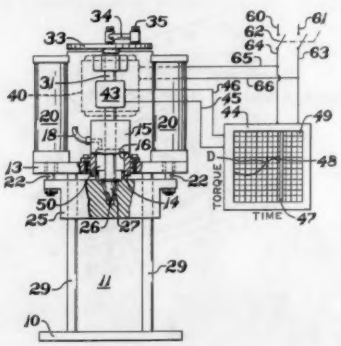
leadwire. If either bond is defective, the drag forces on the leadwire are sufficient to destroy that bond.

3,581,558

TEST INSTRUMENT FOR DETERMINING THE SHEAR MODULUS OF ELASTOMERIC MATERIALS

John P. Porter, Cuyahoga Falls, and Alan G. Veith, Copley, both of, Ohio, assignors to The B.F. Goodrich Company, New York, N.Y.

Filed Dec. 18, 1967, Ser. No. 691,306
Int. Cl. G01n *3/24, 11/00*
U.S. Cl. 73—101 **13 Claims**



An instrument having a quality control circuit for testing the dynamic shear modulus of elastomeric material which is operable to give indications of the deviation of the characteristics of a material under test from a standard characteristic curve. The indication may be given as a series of colored signal lamps controlled by time delayed circuits or as a printed tape with numerical values for comparison with numerical values of a standard characteristic curve.

3,581,559

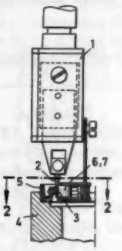
METHOD AND APPARATUS FOR DETECTING FLAWS IN A SEAL

Hans Deuring, Burscheid, and Hans Kling, Cologne-Lindenthal, both of, Germany, assignors to Goetzewerke, Friedrich Goetze A. G., Burscheid, Germany

Filed May 27, 1969, Ser. No. 828,263
Int. Cl. G01b *5/28*
U.S. Cl. 73—105 **5 Claims**

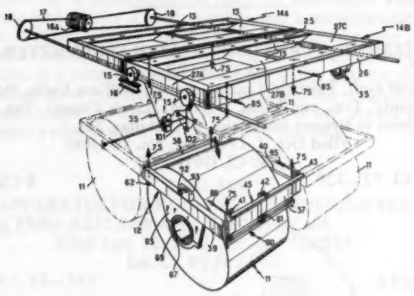
A method and apparatus for testing for flaws on the sealing surface of a seal made of elastic material. The testing is ac-

complished by passing a feeler over the sealing surface to detect the existence and location of flaws by measurement of variations in the friction between the feeler and the sealing



surface. According to the invention the sealing surface is stretched, at least in the region which is in contact with the feeler, to expand or enlarge the flaws.

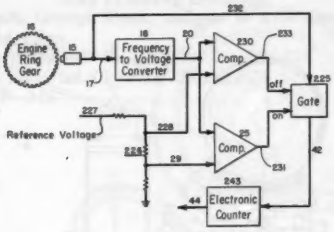
3,581,560
STATIONARY TEST STANDS FOR VEHICLES
Jean Odier, Antony, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France
Filed May 13, 1969, Ser. No. 824,241
Claims priority, application France, May 20, 1968, P.V.152,439
Int. Cl. G01m *17/00*
U.S. Cl. 73—117 **18 Claims**



The invention specifically related to a base frame assembly for test purposes, in which a roller used in the stationary testing of a self-propelled vehicle may be fitted. This test base-frame includes a stationary reference frame, and a floating frame for carrying a roller and is installed on the reference frame by means of devices allowing it to perform small displacements along three orthogonal axes with respect to the reference frame, strain gauges being situated between the said frames. The invention enables a rolling track to be provided for the stationary testing of a self-propelled vehicle, including four test base-frames each carrying one roller.

3,581,561
ENGINE ACCELERATION HORSEPOWER-METERING SYSTEM
James R. Tomashek, Wood Dale, and Donald H. Ward, Glen Ellyn, both of, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed Oct. 27, 1969, Ser. No. 869,631
Int. Cl. G01m *15/00*
U.S. Cl. 73—117.2 **9 Claims**

A magnetic pickup senses rotation of the engine ring gear to provide a frequency-related signal which is translated into a speed-related voltage signal. This voltage signal passes a first speed level w_1 at the commencement of a predetermined time period Δt, established by a multivibrator circuit. At the end of the time period Δt a second speed level signal w_2 is

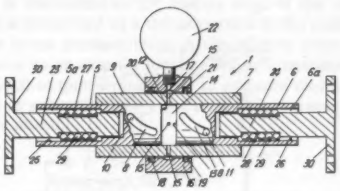


provided. The engine horsepower is then determined by the expression

$$HP = \frac{(w_2)^2 - (w_1)^2}{\Delta t} \cdot \frac{J}{k}$$

where J represents the motor inertia and k is a constant, to provide a value indicative of the engine acceleration horsepower.

3,581,562
TORQUE-SENSING DEVICES
Christopher Shorrock, Preston, England, assignor to All-speeds Holdings Limited, Clayton-le-Moors, Accrington, Lancashire, England
Filed Apr. 28, 1969, Ser. No. 819,639
Int. Cl. G01l *3/14*
U.S. Cl. 73—136 **15 Claims**

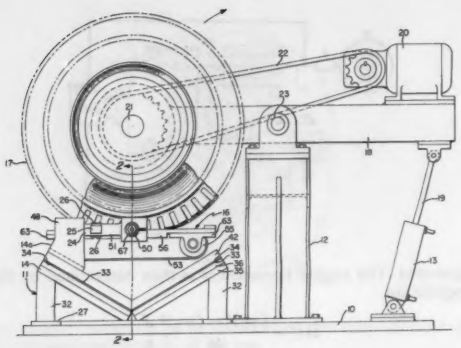


The driving and driven shafts of a torque sensing device are connected by a flexible coupling which includes input and output shafts arranged to rotate with driven shafts respectively. The input and output shafts work in a coupling sleeve, the internal wall of the sleeve and the ends of the input and output shafts defining a chamber filled with fluid and having an outlet to an indicating device. The drive between the input and output shafts and the sleeve consists for each shaft of a pair of diametrically opposed fins on the sleeve which work in opposed helical slots in the shaft. Under load the position of the fins in the slots varies thus moving the shafts together or apart thereby varying the fluid pressure in proportion to the torque and operating the indicating device.

3,581,563
TIRE-TESTING APPARATUS
Christopher E. Christie, Akron; William J. Head, Barberton, and Donald K. Burgett, Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed June 25, 1969, Ser. No. 836,565
Int. Cl. G01m *17/02*
U.S. Cl. 73—146 **14 Claims**

A method and apparatus for continuously measuring the lateral spring rate of a rotating tire. A tire is mounted on a rotatable tire support and urged against an anvil means which is mounted for rectilinear movement relative to a fixed support and in a line parallel to the rotational axis of the tire. Drive means are provided for rotating the tire and imparting the rectilinear motion to the anvil. Means are also provided for measuring the rectilinear movement and the force required to impart the movement. The foregoing abstract is not to be limiting the invention of this application, and in

order to understand the full nature and extent of the technical disclosure of this application, reference must be made to

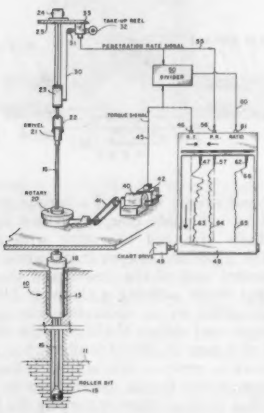


the accompanying drawings and the following detailed description.

3,581,564
METHOD FOR DETECTING ROLLER BIT BEARING FAILURE

Farrile S. Young, Houston, Tex., assignor to Esso Production Research Company

Filed May 14, 1969, Ser. No. 824,497
Int. Cl. E21b *45/00*
U.S. Cl. 73—151 **7 Claims**



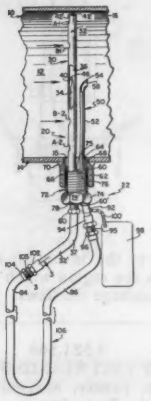
A method for detecting failure of bearings in roller drill bits used in rotary drilling. Two drilling parameters—rotary torque and drilling rate—are measured and plotted with a third parameter (ψ) equals ratio of the parameter of rotary torque divided by the parameter of drilling rate. A sharp increase in the third parameter ψ indicates bearing failure.

3,581,565
FLOW-MEASURING DEVICE

Peter D. Dieterich, 2927 Summit Drive, Michigan City, Ind.

Filed July 15, 1968, Ser. No. 744,800
Int. Cl. G01p *5/16*
U.S. Cl. 73—212 **16 Claims**

A device for measuring fluid flow in a pipe as a function of fluid pressure and having a slidable and/or rotatable impact probe, a static fluid pressure probe at a fixed distance downstream of the impact probe and a pressure differential responsive device connected therebetween exterior of the pipe to provide a measurement representative of fluid flow rate; the impact probe preferably including a blind ended outer conduit extending diametrically across the pipe and having a plurality of laterally spaced openings facing the flow and an inner conduit extending to the axial center of the outer conduit from one end thereof and having a lipped side opening adjacent the inner end thereof and providing the

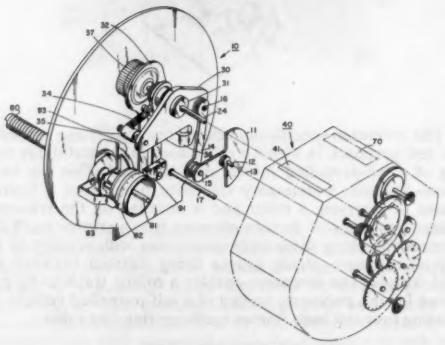


sole communication to the differential pressure-responsive device; said element capable of bodily removal from and/or return to the installed condition in the pipe while fluid pressure is maintained and having indicating means exterior of the pipe to assure proper operative orientation and indicate same.

3,581,566
TEMPERATURE COMPENSATED FLUID METER COUNTER

Randall Goff, Fairfield County, Conn.; William Melis, Harris County, Tex., and Melis, William, Harris County, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

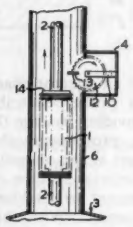
Filed Oct. 3, 1968, Ser. No. 764,808
Int. Cl. G01f *3/00*
U.S. Cl. 73—229 **6 Claims**



A bimetallic temperature sensing probe, adapted to be inserted within the thermowell of a positive displacement gas meter, senses the gas temperature, indicating such temperature on a scale. Temperature-induced rotational movement of the bimetallic element positions a cam which varies the ratio between angular rotation of the gas meter output shaft and rotation of the display counter in such a manner as to correct the indicated gas flow to standard conditions. The variable ratio drive imposes an intermittent load on the bimetallic probe assembly, allowing the cam and indicating scale to rotate freely during part of each cycle. The variable ratio drive is accomplished by a crank disc and connecting

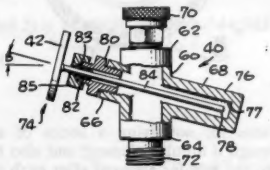
rod assembly which causes a driving arm to oscillate in an arc upon an idler bearing about a shaft. A driven arm, carrying an overrunning clutch, is driven by the driving arm by an amount whose limits are determined by the cam in one direction and by the duration of the arc of the driving arm in the other direction. The overrunning clutch allows a counter indicative of gas volume to be driven by the movement of the driven arm in the direction away from the cam.

3,581,567
LIQUID LEVEL INDICATING DEVICE
Albert Albisser, Boucherville, Quebec, Canada, assignor to Molson Industries Limited-Les Industries Molson Limitee, Montreal, Quebec, Canada
Filed Mar. 4, 1969, Ser. No. 804,223
Claims priority, application Canada, Dec. 23, 1968, 038,528
Int. Cl. G01f *23/10*
U.S. Cl. 73—313 **1 Claim**



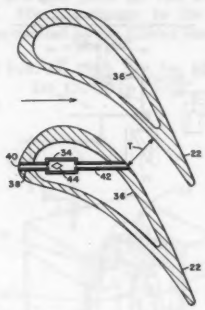
A liquid level indicating device in which a float-rod member has a predetermined range of movement within a housing and carries a rack member and a magnetizable element. A rotary gear having a magnet is mounted on the housing and cooperates with the rack member in controlling the rotation of a potentiometer connected to the gear for signaling liquid level variations. The magnet and the magnetizable element cooperate to ensure that the gear will always be in the same position when it is engaged by the rack.

3,581,568
APPARATUS FOR HOLDING A THERMOMETER
Irving Pfefer, 6232 Atoll Ave., Van Nuys, Calif.
Filed Apr. 12, 1968, Ser. No. 720,757
Int. Cl. G01k *13/02*
U.S. Cl. 73—343 **6 Claims**



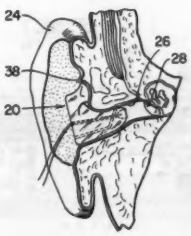
Apparatus for holding a stem thermometer to measure the temperature of water issuing from a faucet comprising a fitting body with a first end for coupling to the faucet, a second end for discharging water from the body into a pipeline or directly into a sink, and a third end for receiving a stem thermometer so that its stem extends across the path of water flowing through the fitting body. The third end is oriented at less than 90° with the first end so that it extends with a downstream component, thereby preventing the passage of water through the third opening when the thermometer is removed and the second end is opened to allow water to fall directly into the sink. The fitting body is also provided with a fourth end located opposite the third end, for receiving the outer end of the stem of a thermometer, the fourth end being sealed to prevent the outflow of water therefrom.

3,581,569
MOUNTING OF FLUIDIC TEMPERATURE SENSOR IN GAS TURBINE ENGINES
Jay I. Black, Orange, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Nov. 28, 1969, Ser. No. 880,528
Int. Cl. G01k *13/02, 11/26*
U.S. Cl. 73—346 **7 Claims**



Fluidic oscillator positioned in the interior of a turbine nozzle vane used in a gas turbine engine. The inlet to the oscillator is connected to the leading edge of the vane and the outlet is connected to a throat portion in the nozzle so as to be at a lower pressure level. A closed tube extends from the oscillator to an exterior location where a transducer provides a signal output proportional to pressure oscillations in the sensor as a function of the gas temperature passing across the turbine nozzle.

3,581,570
THERMAL RADIATION SENSOR
Edward C. Wortz, Northridge, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Sept. 5, 1967, Ser. No. 665,396
Int. Cl. G01j *5/06;* **G01k** *1/14*
U.S. Cl. 73—355R **6 Claims**

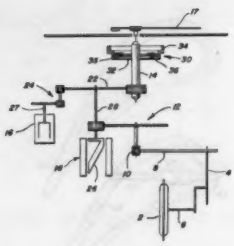


An instrument sensor member has positioning means to establish a fixed relationship between the member and a small selected area of a living organism. Thermal radiation flux from the area impinges on a concave surface on the member and is reflected to a radiometer fixed at the focus of the surface. The thermal radiation provides a measure of the temperature of the blood in the vessel or vessels immediately under the surface of the area which may be the tympanic membrane as disclosed herein.

3,581,571
FAIL-SAFE AIRCRAFT INSTRUMENT AND SERVO STABILIZER THEREFOR

James W. Angus, Baldwin, N.Y., assignor to Kollsman Instrument Corporation, Syosset, N.Y.

Filed Mar. 3, 1969, Ser. No. 803,722
Int. Cl. G01d 11/10; G07l 7/12
U.S. Cl. 73—386 7 Claims

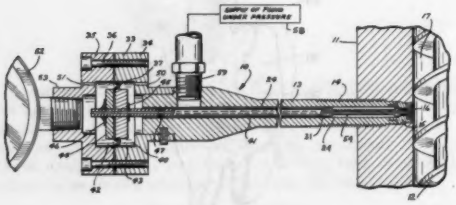


A fail-safe servo pneumatic indicating system is provided wherein the pneumatic drive is connected to the indicator of the instrument through a first gear train. The motor of the servodrive is connected, by a second gear train, to an intermediary gear of the first gear train. The synchro of the servodrive is mounted to the shaft of the above-mentioned intermediary gear. A stabilizer is provided which comprises an impact element riding with the indicator shaft and mounted for a predetermined amount of free rotary movement relative to the shaft so that it will provide kinetic energy to the system in opposition to kinetic energy imparted to the system upon incidence of oscillation of the indicator.

3,581,572
EXTRUDER PRESSURE SENSOR

Roger L. Frick, Minneapolis, Minn., assignor to Rosemount Engineering Company, Minneapolis, Minn.

Filed June 6, 1969, Ser. No. 831,103
Int. Cl. G01l 7/08
U.S. Cl. 73—406 11 Claims

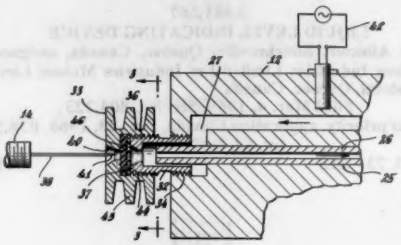


A pressure sensor for use with high-pressure extruders utilizing a mechanical force-rebalance system wherein a pressure sensed at a first diaphragm causes a flow of fluid from a source of fluid under pressure to enter a chamber. The fluid pressure acts on a second diaphragm or piston member to balance the force on the first diaphragm through a mechanical system. The amount of fluid pressure at the second diaphragm necessary to rebalance the first diaphragm is indicative of the pressure sensed by the first diaphragm.

3,581,573
SAMPLE INJECTION ARRANGEMENT FOR AN ANALYTICAL INSTRUMENT

John E. Purcell, Greenwich, and Kenneth Billeb, Norwalk, both of, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 27, 1967, Ser. No. 693,926
Int. Cl. G01n 31/08
U.S. Cl. 73—422 8 Claims

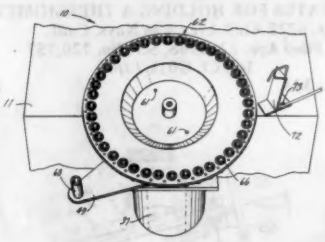


A wall segment for an injector chamber in an analytical instrument includes a probe-penetrable, self-sealing septum body adapted for providing passage therethrough of a sample probe. A shielding, probe-penetrable body, formed of a material which is inert at the operating temperature, is positioned between an interior surface of the septum body and the chamber environment for shielding the septum body from the chamber environment. With this arrangement, the introduction of contaminating substances from the septum body into the chamber and retention of portions of the sample thereby is substantially reduced.

3,581,574
SAMPLE SUPPLY APPARATUS

Edwin W. Smith, Climax Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 12, 1969, Ser. No. 823,776
Int. Cl. G01n 1/02
U.S. Cl. 73—423 12 Claims



An apparatus for supplying a series of samples to an analyzer, through a tubular element and also for supplying a wash liquid to the tubular element after each of the samples. A radial arm turret having a wash cup upon the end thereof is provided with a drive for rotating the arm through a plurality of stations. A sample carrier is rotatably mounted on the arm and has a plurality of index positions each holding a sample cup with respect to said arm. Gear means between the arm and carrier causes the carrier to rotate a predetermined amount each time the arm rotates 360°, thereby advancing the carrier one index position during each rotation of the turret. The carrier orbits around the rotational axis of the arm so that the carrier is moved toward and away from at least one of the plurality of said stations whereby a series of points on the carrier and one point on the arm can sequentially and alternately occupy the same station during continued rotary movement of said turret. Means are provided for advancing the turret and carrier alternately toward the tubular element so that the sample and wash liquid may be supplied therethrough.

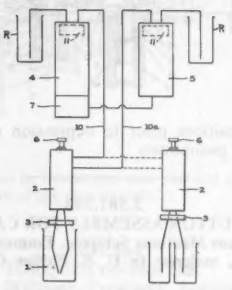
3,581,575
DISPENSING APPARATUS FOR RECEIVING AND DISCHARGING A PRECISELY PREDETERMINED VOLUME OF FLUID

Robert Roy Butler, Tadworth, Surrey, England, assignor to Fisons Limited, Felixtowe, Suffold, England

Continuation-in-part of application Ser. No. 654,737, July 1, 1967, Continuation-in-part of application Ser. No. 654,737, July 20, 1967, now abandoned. This application Apr. 11, 1969, Ser. No. 815,463

Int. Cl. G01n *17/00*

U.S. Cl. 73—425.6 **12 Claims**



A motorized syringe for receiving and dispensing and/or diluting very accurately controlled amounts of liquids in combination with a separate portable or remote, hollow-bodied control unit connected by a flexible conduit to one or more such motorized syringes. The operation of a plurality of the motorized syringes may be integrated by means of a programmed operating means whose operation cycle is initiated from the remote control unit connected therewith, with the attendant advantage that complex operations requiring the use of many such syringes in combination with one another may be carried out at a single location, with the operator merely exchanging vessels serving the liquid-conducting outlet/inlet tube or tubes provided in the remote control unit and connected with the flexible conduit, whereby the liquid is readily dispensed or picked up; and, if necessary, some further stage of the process can be initiated by actuation of one or more control buttons provided on the control unit. The outlet/inlet tubes are of relatively small diameters and have interchangeable probelike portions with a free end projecting a substantial distance beyond the body to facilitate picking up liquid from and/or dispensing liquid into vessels having relatively narrow, elongated necks.

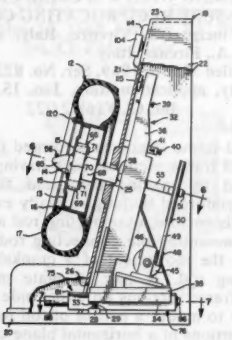
3,581,576
UNBALANCE DETECTOR FOR ROTATABLE BODY

Alfred A. Reiser, 6976 Old Lake Shore Road, Lake View, N.Y.

Filed July 11, 1968, Ser. No. 744,055

Int. Cl. G01m *1/22*

U.S. Cl. 73—459 **8 Claims**



A device for detecting the location and amount of unbalance in a rotatable body such as a rubber-tired automobile wheel having an overweight point in its peripheral area, comprising supporting the wheel for rotation about an axis at an acute angle to the horizontal while allowing the wheel support to oscillate about a horizontal axis arranged in a vertical plane intersecting with the plane of rotation of the wheel near the top thereof, and indicating the extent of unbalance when the overweight point on the wheel arrives at the lower extreme of its vertical movement during wheel rotation.

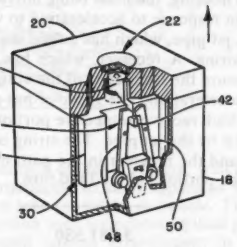
3,581,577
ACCELERATION-SENSITIVE ACTUATOR

George A. Ray, Jr., and John H. Von Dreele, both of Albuquerque, N. Mex., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 28, 1969, Ser. No. 803,155

Int. Cl. G01p *15/04*

U.S. Cl. 73—492 **3 Claims**



A device for sensing a level of acceleration lasting for a given time period and initiating a response thereto. An element movable in response to acceleration forces carries an actuator member and also a trigger mechanism that has a rotatable finger to normally hold the actuator member, actuation of the trigger mechanism being controlled by a cam that swings the finger after a predetermined movement.

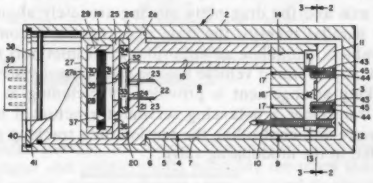
3,581,578
JET ADJUSTMENT MEANS FOR FLUID JET DEFLECTION TYPE INSTRUMENTS

Wilfred C. Schuemann, Rawlings Heights, Rawlings, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 5, 1969, Ser. No. 830,828

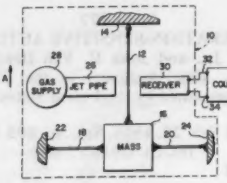
Int. Cl. G01p *15/00*

U.S. Cl. 73—515 **6 Claims**



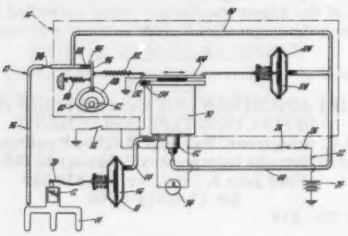
An instrument wherein the deflection of a fluid jet, induced for example by the angular movement of the instrument, produces a signal proportional to the deflection, and particularly, such an instrument having means for adjusting the jet into a centered condition relative to the sensing means. The means herein disclosed comprises a plurality of adjusting elements such as setscrews that are turned down to provide an obstruction in the flow path of the fluid to the jet nozzle, the adjusting elements being located adjacent to and symmetrically about the nozzle inlet.

3,581,579
FLUIDIC ACCELEROMETER
Albertus E. Schmidlin, Caldwell, and John L. Evans, Oakland, both of, N.J., assignors to Singer-General Precision, Inc., Little Falls, N.J.
Filed July 17, 1968, Ser. No. 745,488
Int. Cl. G01p 15/10
U.S. Cl. 73—515 10 Claims



An accelerometer comprising a string suspended between a mass and a housing, the mass being movable with respect to the housing in response to acceleration to vary the tension on the string. A jet pipe, which has a fluid supply, is provided to vibrate the string. A receiver, which has a counter, is provided to measure the frequency of the vibration to give an indication of acceleration. The receiver has a pair of fluid inlet chambers, which receive respective portions of the fluid flow that is emitted by the jet pipe. The string is disposed between the jet pipe and the receiver in the path of the fluid flow for controlling the portions of the fluid flow.

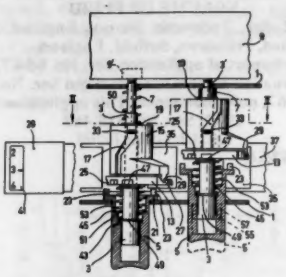
3,581,580
VEHICLE SPEED TRANSDUCER ASSEMBLY FOR A VEHICLE ROAD SPEED CONTROL SYSTEM
Henry H. Harada, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 14, 1969, Ser. No. 876,731
Int. Cl. G01p 3/49
U.S. Cl. 73—519 5 Claims



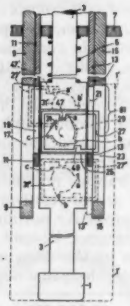
A speed transducer having an eddy current coupling speed sensor with the vehicle speed driven magnet rotating about one axis and the drag plate moving arcuately about another axis parallel thereto, the drag plate having a control valve movable to modulate an atmospheric air inlet port to a pneumatically operated vehicle road speed control system. A self-tracking arrangement is provided by including as a part of the transducer a balancing servomotor actuated by control pressure and controlling the tension on a tracking pring connected to the modulating valve.

3,581,581
PUSHBUTTON SET
Wilhelmus Hermanus Christianus Withoos, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 21, 1969, Ser. No. 826,413
Claims priority, application Netherlands, May 31, 1968, 6807774
Int. Cl. F16h 35/18
U.S. Cl. 74—10.27 4 Claims

A pushbutton set for selection of wave ranges in a device such as a radio or television receiver where axial depression of a button causes a coaxial sleeve to rotate through a preselected angle, and the sleeve is variably set to preselected positions prior to depression of the button by rotation of the pushbutton.



3,581,582
PUSHBUTTON ASSEMBLY FOR CAR RADIO
Lucas Wilhelmus Martinus Schijven, Emmasingel, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.
Filed Aug. 14, 1969, Ser. No. 850,176
Claims priority, application Netherlands, Aug. 16, 1968, 6811653
Int. Cl. F16h 35/18
U.S. Cl. 74—10.33 7 Claims

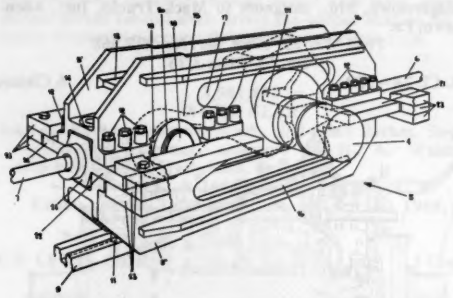


Pushbutton tuning device with at least one pair of slidable actuating rods alternately actuated by a common pushbutton.

3,581,583
CRANK GEARING WITH A SPECIAL CROSSHEAD FOR HIGH PRESSURE RECIPROCATING COMPRESSORS
Costa ntino Vinciguerra, Virenze, Italy, assignor to Nuovo Pignone S.p.A., Firenze, Italy
Filed May 8, 1969, Ser. No. 823,094
Claims priority, application Italy, Jan. 15, 1969, 835,185/69
Int. Cl. F16h 21/22
U.S. Cl. 74—44 5 Claims

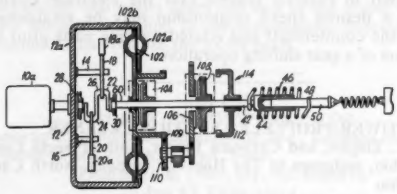
A crosshead frame structure is formed from two identical elongated rigid frame sections, each having spaced sidewalls interconnected by spacing blocks at the opposite ends thereof and reinforced by longitudinally extending ribs. The frame sidewalls enclose a connecting rod and have openings for rotatably mounting the connecting rod gudgeon and accommodating the movement of a crankshaft connected to the connecting rod. A pair of plate members mounted between the frame sections on either side of the crankshaft opening serve to mount a pair of piston rods and further include wing portions in a horizontal plane containing the motion axis of the piston rods. Also, a pair of vertical plate portions are mounted to the lower frame section of the crosshead in a vertical plane containing the motion axis of

the piston rods. Corresponding horizontal and vertical guide means secured to the housing for the crosshead guide the



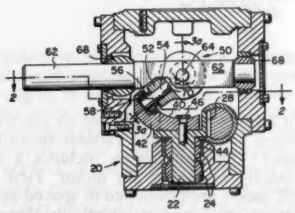
crosshead structure in horizontal and vertical planes containing the motion axis of the piston rods.

3,581,584
TORQUE CONVERTER
Frederic Calland Williams, Prestbury, England, assignor to National Research Development Corporation, London, England
Filed Dec. 17, 1968, Ser. No. 784,446
Claims priority, application Great Britain, Jan. 8, 1968, 1100/68
Int. Cl. F16h *33/02, 3/74*
U.S. Cl. 74—64 **19 Claims**



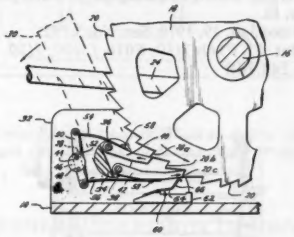
The invention relates to a torque converter in which a prime mover such as an internal combustion engine, producing rotary movement, is arranged to produce oscillating torque which is then applied via a one-way clutch and a spring to a lost motion device in turn connected to the load. The arrangement is such that the combination of the clutch and spring transfers movement in one direction only to the load.

3,581,585
HARMONIC OSCILLATOR APPARATUS
Joseph K Barnoski, 319 Lorenzo Place, Elmira, N.Y.
Filed May 26, 1969, Ser. No. 827,816
Int. Cl. F16h *21/44*
U.S. Cl. 74—98 **9 Claims**



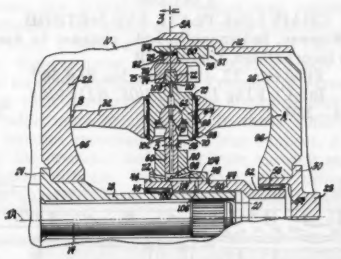
An input shaft and an output shaft are so interrelated that the axis of the input shaft is disposed at right angles to and intersects the axis of the output shaft. Means is provided for oscillating the input shaft. An eccentric connecting means is connected with the input shaft and extends laterally thereof. This eccentric connecting means is movably connected with a clevis which is pivotally interconnected with the output shaft. Means is provided in one form of the invention for adjusting the connection between the eccentric connecting means and the clevis.

3,581,586
RATCHET WINCH
Walter L. Blackburn, 6105 England St., Houston, Tex.
Filed Apr. 19, 1968, Ser. No. 722,658
Int. Cl. F16h *29/00*
U.S. Cl. 74—159 **25 Claims**



The present invention relates to hoists, winches, and the like, and more particularly, to such apparatus which utilize ratcheting means to take in and let out cable. The apparatus of the present invention uses reciprocating dual pawls and an eccentrically mounted linkage arrangement to engage and disengage the dual pawls. Cam surfaces are also utilized to engage one or both of the pawls when the linkage is in its disengaged position while tension is still being exerted through the cable, or in an alternate embodiment, when no tension is exerted through the cable. A disc brake is also utilized to vary the braking force supplied to the ratchet wheel.

3,581,587
TRANSMISSION
Frank Dickenbrock, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 6, 1969, Ser. No. 822,121
Int. Cl. F16h *15/38*
U.S. Cl. 74—200 **8 Claims**



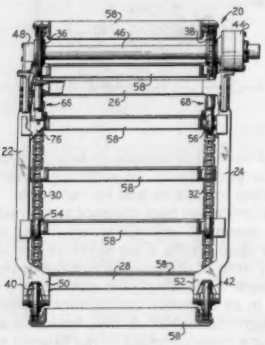
A toroidal friction roller-type transmission including a housing, input and output shafts rotatably mounted therein, input and output toroidal-shaped races secured to the input and output shafts, respectively, a plurality of rollers frictionally mounted between the races, a ring-type support member maintained in a nonrotating position in the housing, a ratio collar rotatably mounted in a track formed in the inside surface of the ring member, a plurality of cam grooves formed on an angle in the ratio control collar, means for rotating the control collar in the track, a central hub portion rotatably mounted on one of the shafts and secured to the ring member by spokes extending therebetween and alternately spaced with respect to the rollers, radial openings formed in the hub portion, a mast secured in each of the radial openings and extending radially outward into a center

opening formed in each roller, a carrier rotatably supported on bearings in the center opening and pivotably connected to the extended end of the mast, pin means for limiting the amount of inclination of the carrier on the mast, an extension formed on the carrier and extending radially outward into the angled cam grooves such that any rotary movement of the control collar will initially incline the carrier extensions, the carriers, and the rollers about the axes through the points of contact between the rollers and the races, thereby creating large tractive forces which will cause the rollers to tilt in a plane perpendicular to inclined planes of the rollers until the inclination returns to zero.

3,581,588
CHAIN ADJUSTER

Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 19, 1970, Ser. No. 3,792
Int. Cl. F16b *7/10;* **F01b** *15/00, 7/20*
U.S. Cl. 74—242.14R **15 Claims**

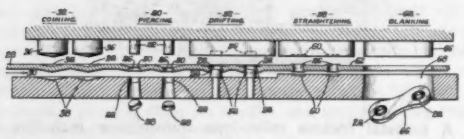


A hydraulic adjuster assembly is provided for the endless chain of an elevator to provide a means for easily adjusting the tension in the chain. The adjuster assembly is provided with a releasable mechanical lock means to prevent the transmission of forces to the adjuster after an adjustment has been made.

3,581,589
CHAIN LINK PLATE AND METHOD

Baird E. Resener, Indianapolis, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Oct. 22, 1969, Ser. No. 868,507
Int. Cl. F16g *13/02, 13/08;* **B21s** *9/04*
U.S. Cl. 74—250 **3 Claims**

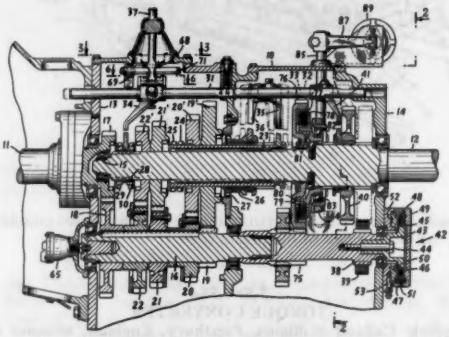


An improved link plate for a power transmission chain is disclosed, the chain having a plurality of metallic hoops surrounding the apertures of the link plate. The use of the loops increase the cross-sectional area of the link plate and decrease the stress created by a given interference fit of the assembled mating pin or bushing member and the tensile load imposed on the chain. In addition, the hoops serve to separate adjacent link plates thereby preventing these links from rusting together when the chain is not in use. Also disclosed is a method for forming the hoops by taper drifting a pair of pierced apertures.

3,581,590
DEVICE FOR FACILITATING TRANSMISSION SHIFTING

Irvin G. Detra, Mertztown, Pa., and Patrick J. Crowley, Hagerstown, Md., assignors to Mack Trucks, Inc., Allentown, Pa.

Filed May 23, 1969, Ser. No. 827,368
Int. Cl. F16h *3/38*
U.S. Cl. 74—339 **6 Claims**

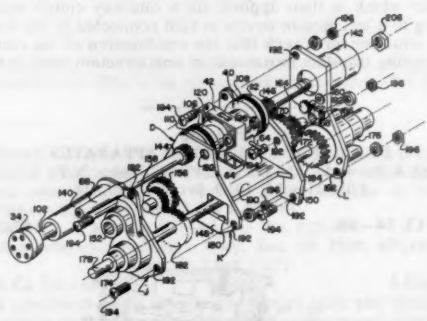


A shifting apparatus for a vehicle transmission having a multiplicity of sets of gears, operator-controlled means to change the speed of rotation of the transmission countershaft prior to the completion of a gear shift operation, an electrical circuit actuated by the operator for actuating the operator-controlled means, and a device responsive to the speed of the countershaft to exercise control over the electrical circuit whereby a desired speed relationship may be established between the countershaft and related rotating parts prior to completion of a gear-shifting operation.

3,581,591
POWER-PROPELLED SUCTION CLEANER

Brandt F. Ziegler, and Christian Berger, both of North Canton, Ohio, assignors to The Hoover Company, North Canton, Ohio

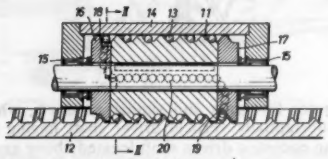
Filed July 1, 1969, Ser. No. 838,731
Int. Cl. F16h *3/14*
U.S. Cl. 74—377 **6 Claims**



An upright suction cleaner includes an electric motor for supplying torque to a reversible variable-speed transmission on the cleaner. The transmission includes a driven shaft which is rotatably driven by the motor. First and second power takeoff means are positioned in spaced-apart relationship on the driven shaft for rotation relative thereto. A clutch is positioned on the driven shaft between the spaced-apart power takeoff means. The clutch is rotatable with the driven shaft and is shiftable axially relative to the driven shaft for selectively drivingly engaging either the first or second power

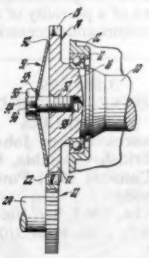
takeoff means. A manually actuatable operating device is connected with the clutch for selectively shifting the clutch into engagement with either the first or second power takeoff means. The first power takeoff drives an output shaft in a first rotational direction through a first gear train, and the second power takeoff shaft drives the output shaft in an opposite rotational direction through a second gear train.

3,581,592
WORM GEAR
Karl H. Roehrs, Bellevue, Wash., and Josef Berkes, Siegen, Westphalia, Germany, assignors to H. A. Waldrich G.m.b.H., Siegen, Westphalia, Germany
Filed Apr. 9, 1969, Ser. No. 814,696
Claims priority, application Germany, Apr. 10, 1968, P 17 50 234.0
Int. Cl. F16h *1/18, 55/02*
U.S. Cl. 74—424.6 **3 Claims**



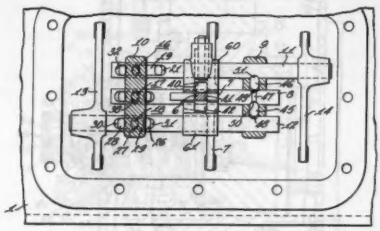
A worm gear having a worm and a worm rack is characterized by circulating balls extending over the entire length of the worm gears between the worm and the worm rack, ball supports adjacent the circumferential surface of the worm, a channellike ball outlet upon one end of the worm, a return bore passage extending in the longitudinal direction and a channellike ball inlet to the worm gears.

3,581,593
GEAR VIBRATION ARRESTOR
Donovan L. Robinson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 8, 1969, Ser. No. 855,976
Int. Cl. F16h *55/14*
U.S. Cl. 74—443 **12 Claims**



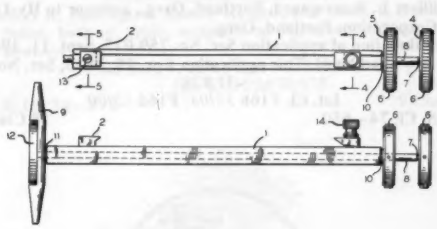
A sound reduction or aborting device for a gear web having a conical annular spring having its outer perimeter continuously engaging in frictional contact with the side face of the web at the circle of anodic areas at or adjacent the pitch circle and a fastening pivotally contacting the central portion or inner perimeter of the annular conical spring providing a preselected preloading and a universal pivoting action so that deflection forces moving the spring in one direction at any point on the outer perimeter cause an opposite movement at the diametrically opposite point on the perimeter causing a distribution, dissipation and interference of vibrations for a reduction in deflection and to prevent resonance causing excessive sound.

3,581,594
SHIFT RAIL STOP
Donald W. Longshore, New Berlin, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Dec. 22, 1969, Ser. No. 887,163
Int. Cl. G05g *9/00*
U.S. Cl. 74—475 **10 Claims**



A detent mechanism on a shift rail to define shift positions of the rail and stops to prevent overshifting of the shift rail.

3,581,595
CAMERA LENS REMOTE CONTROL
Duane E. Carlson, 3709 4th Ave., South Milwaukee, Wis.
Filed June 2, 1969, Ser. No. 829,173
Int. Cl. G05g *1/08*
U.S. Cl. 74—511 **8 Claims**

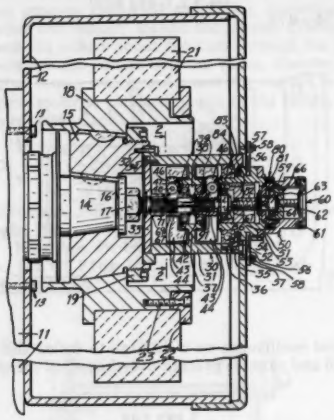


A device for actuating the adjustment mechanism for the combination of lenses on a camera generally known as a zoom from a remote point proximate to the operator's position. Conventional cameras either employ a handle mounted on each support of the Zoomar for extending and retracting such lenses or they are equipped with complex internal adjustment mechanisms. In those cameras which rely on handles mounted on the lens support, a fatiguing reach by the operator makes accurate viewing and careful manipulation difficult. To eliminate such difficulty this invention links lens support actuators with controls at the operator's position.

3,581,596
BALANCING APPARATUS FOR A ROTATING ELEMENT
George E. Wespi, Holden, Mass., assignor to Norton Company, Worcester, Mass.
Filed Apr. 28, 1969, Ser. No. 819,882
Int. Cl. F16f *15/22*
U.S. Cl. 74—573 **7 Claims**

A primary housing mounted for rotation with a given rotating element and rotatably supporting a secondary housing externally maintained nonrotating, the primary housing enclosing and rotatably supporting first and second eccentrically weighted balancing members normally maintained in fixed angular relation to the given rotating element, and the secondary housing rotatably supporting first and second externally accessible control members each selectively independently

operable to change the normally fixed angular relationship between one of the balancing members and the given rotat-

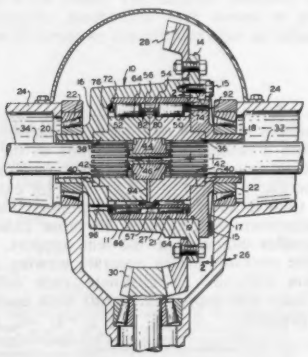


ing element within a 360° range of adjustment as required to balance the given rotating element.

3,581,597
DIFFERENTIAL DRIVE MECHANISM

William L. Reiersgaard, Portland, Oreg., assignor to Hy-Torq Corporation, Portland, Oreg.

Continuation of application Ser. No. 759,025, Sept. 11, 1968, now abandoned. This application Apr. 29, 1970, Ser. No. 31,828
Int. Cl. F16h *35/04*; F16d *15/00*
U.S. Cl. 74—650 **18 Claims**

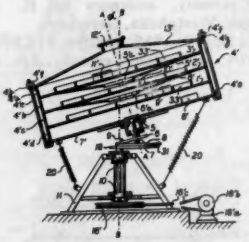


A differential drive mechanism has a driven rotatable body serving to drive either or both of a pair of coaxially mounted, axle-driving hubs and to permit overrunning of either hub. Rollers between the hubs and the bodies are mounted in two cages which have limited lost motion therebetween and which are individually retarded by O-ring actuators to move the rollers into driving engagement with the hubs and the body, and are individually held in free running positions by damping O-rings. The body has grooves into which the rollers laterally project and having ramp angles between about 3° and about 6° to wedge the rollers between the body and the hubs.

3,581,598
POSITIVELY CONTROLLED WOBBLE-SIFTING MACHINE

Oskar Allgaier, Wangen near, Goppingen, and Hans Angermann, Munich, both of, Germany, assignors to Allgaier-Werke GMBH, Uhingen/Wurttemberg, Germany

Filed May 7, 1969, Ser. No. 822,415
Claims priority, application Germany, May 18, 1968, P1757570.1
Int. Cl. G05g *3/00*
U.S. Cl. 74—600 **8 Claims**

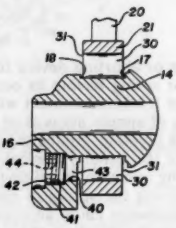


A separator for grain and similar products, which comprises a substantially vertical driver shaft having an upper end, and an eccentric driven shaft located above and inclined with respect to the driver shaft. The eccentric driven shaft has an upper end and a lower end, and a product receiving casing is located above and receives rotatably the upper end of the driven shaft, so as to wobble when the driven shaft orbits about driver shaft. The casing is arranged to assume the inclination of the driven shaft. An arrangement for transmitting motion from the driver shaft to the driven shaft is provided and the arrangement comprises a baseplate fixed to the upper end of the driver shaft and a supporting plate fixed to the lower end of the eccentric driven shaft. The baseplate includes a slide radially movable on the baseplate. Hinge means connect pivotally the baseplate to the supporting plate about two imaginary axes disposed at a substantially right angle relative to and independently from each other for setting the radial angle about one of the axes and the tangential angle about the other of the axes of the supporting plate relative to the baseplate, so that the supporting plate is pivotable about both axes into different positions of the eccentricity of the driven shaft independently of the adjustment of the inclination thereof. Also securing means are provided which cooperate with the hinge means for holding the supporting plate in any one of a plurality of different positions of inclination in two directions and eccentricity.

3,581,599
THREAD-ON CONNECTING ROD AND CRANK ASSEMBLIES

Arthur Lee, North Vancouver, and John C. Stainsby, South Burnaby, both of, British Columbia, Canada, assignors to Skil Corporation (Canada) Ltd., Power Machinery Division, Richmond, Canada

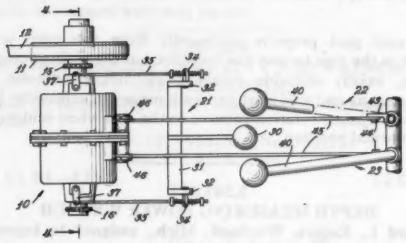
Filed July 14, 1969, Ser. No. 841,475
Int. Cl. G05g *1/00*; F16c *3/06*, *43/00*
U.S. Cl. 74—603 **8 Claims**



A thread-on crank and connecting rod assembly and a crank for such an assembly, having a plurality of roller

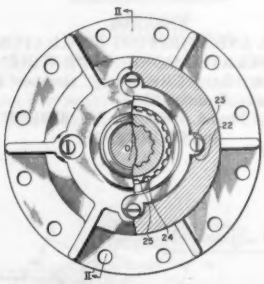
bearings located in a race constituted by the bearing surfaces of the crankpin and the big end of the connecting rod and in which the last few of the roller bearings are inserted through an axial opening in one of the crank webs.

3,581,600
TRANSMISSION MECHANISM
John W. Holdeman, Auburn, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed May 29, 1969, Ser. No. 828,981
Int. Cl. F16h *37/06, 57/10*
U.S. Cl. 74—665 23 Claims



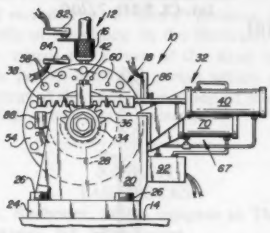
A transmission having plural output paths including a single input shaft and a pair of planetary gear sets each adapted to drive an output member, means on said output member being shiftable to engage a forwardly or reversely rotating member of said planetary gear sets to provide a reduced speed drive in forward or a reduced speed drive in reverse by means of braking mechanisms for reaction elements of each gear set. The brake mechanism being arranged such that in forward or reverse operation one of the brake mechanisms will be connected to an element connected to the output member such that the particular brake mechanism can be actuated to serve as a vehicle brake for the wheels or track driven by that particular output member.

3,581,601
SLIP SENSITIVE DIFFERENTIAL GEARING
Shin Kitano, Kariya-shi, Japan, assignor to Aisin Seiki Company Limited, Kariya-shi, Japan
Filed May 5, 1969, Ser. No. 821,591
Claims priority, application Japan, May 6, 1968, 43/30159
Int. Cl. F16d *11/12*; F16h *1/44*
U.S. Cl. 74—711 6 Claims



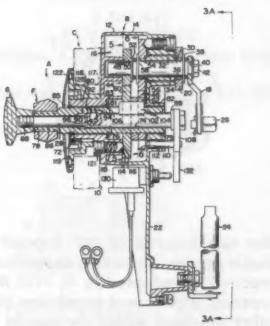
A limited slip differential mechanism for a motor vehicle, comprising a rotatable casing and a differential gearing, said mechanism being characterized by that the outer clutch plates of clutch means provided for slip limitation are tightly compacted under axial compression by means of a plurality of bolt-and-nut means into a packed assembly together with inner clutch plates of the same clutch means, thereby providing an easy adjustment of preloading pressure for said clutch means without overhaul of the packed clutch assembly and as positioned within the interior space of the differential.

3,581,602
INDEXING APPARATUS
Eugene P. Bachmann, Bloomfield, Conn., assignor to The Birken Manufacturing Company, Bloomfield, Conn.
Filed Feb. 3, 1969, Ser. No. 812,513
Int. Cl. B23q *17/18*
U.S. Cl. 74—822 15 Claims



An indexing apparatus for a machine tool or the like and having a rotatable index table, a compact rack and pinion drive mechanism including a unitary clutch for indexably moving said table to a plurality of approximate index positions relative to a work station, and mechanism for accurate positioning and holding the table in its various index positions and comprising a plurality of circumaxially spaced pins projecting from the table and one or more pin-engaging elements or yokes for selective engagement with the aforesaid pins. The table is angularly adjustable relative to the drive mechanism so that the number of index positions and the angular spacing therebetween may be readily varied.

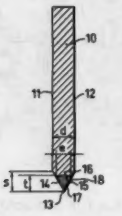
3,581,603
MARINE ENGINE CONTROL
Robert K. Farrington, Shaker Heights, and Louis T. Horvath, Solon, both of, Ohio, assignors to Marmac Products, Inc., Bedford Heights, Ohio
Filed July 9, 1969, Ser. No. 840,329
Int. Cl. F92d 74/875
U.S. Cl. 74—876 9 Claims



A single lever throttle and transmission control for marine engines mounted remote from the engine and connected to the engine by throttle and transmission control cables. The control comprises an operating handle, a hollow rotatable actuating shaft to which the operating handle is connected, a slider axially movable within the shaft, and throttle and transmission driving elements connected to the control cables. A key positionable by the slider operatively connects the actuating shaft with both the throttle and transmission driving elements when the slider is in a first axial position, and with only the throttle driving element when the slider is in a second axial position.

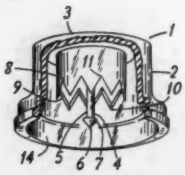
Further the mounting for the control is a flanged member which is fastened to a side panel on the boat and the control is then fastened and keyed to this member from the backside of the panel. The member has indicia thereon to assist in angularly locating it so that the control cables from the control extend at the proper desired angle.

3,581,604
CUTTING STRIPS, CUTTING DIE KNIVES, CUTTING RULES AND THE LIKE
Eugene Olof Malm, Snadviken, Sweden, assignor to Sandvik Steel of Colorado, Inc., Denver, Colo.
Original application June 14, 1966, Ser. No. 557,428, now Patent No. 3,411,208. Divided and this application Nov. 18, 1968, Ser. No. 798,524
Int. Cl. B21k *21/00*
U.S. Cl. 76—101 **4 Claims**



A method for producing a steel cutting strip with a main strip portion of substantially uniform hardness throughout, and a cutting edge portion integral therewith which is of much greater hardness throughout. The cutting edge portion is connected to the main strip portion by a thin layer integral with both of said portions. With this arrangement the cutting edge is sufficiently small to permit it to be bent without damage, even though it is extremely hard, and the bond to the main strip portion remains intact.

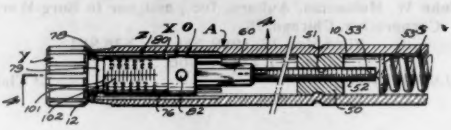
3,581,605
OPENING DEVICE FOR MEMBRANE-SEALED PLASTIC BOTTLES
John Robert Taylor, Mountain Lakes, N.J., assignor to Allied Chemical Corporation, NY, N.Y.
Filed Oct. 29, 1969, Ser. No. 872,262
Int. Cl. B67b *7/24*
U.S. Cl. 81—3.49 **6 Claims**



A device for safe removal of and disposal of membrane seals from plastic bottles containing dangerous liquids comprising a protective cap adopted to fit over the neck of the bottle to be opened, a combined membrane piercing and extracting member mounted within the cap in recessed position, and an annular cutting member having a serrated cutting edge mounted within the cap in recessed position surrounding the combined membrane piercing and extracting member.

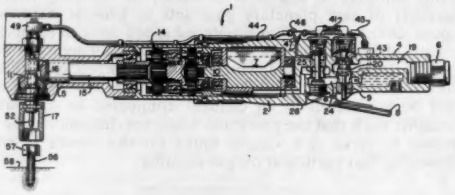
3,581,606
TORQUE WRENCH
Bosco Grabovac, Altadena, Calif., (C.D.I., 818 E. Broadway, San Gabriel, Calif.)
Filed May 23, 1969, Ser. No. 827,331
Int. C'. B25b *23/14*
U.S. Cl. 81—52.4 **8 Claims**

An adjustable torque wrench having an elongate tubular lever arm with front and rear ends, a work engaging head pivotally connected to its front end, spring actuated means within the arm to yieldingly prevent the head from pivoting relative to the arm, and manually operable adjusting means to vary the resistance of the spring actuated means, said manually operable means including an elongate, calibrated cylindrical part with a manually engageable enlargement at its rear end rotatably and shiftable engaged in the rear end of the arm and shiftable from a normal position where the part occurs within the arm and the enlargement occurs adjacent the rear end of the arm to an actuated position where the



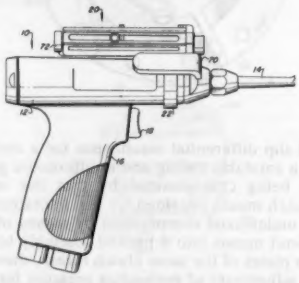
calibrated part projects rearwardly from the arm, screw means in the arm to vary the resistance of the spring actuated means, axially shiftable rotary drive means between the screw means and said part and lock means to releasably lock said part against rotation relative to the arm when said part is in its normal position.

3,581,607
DEPTH MEASURING POWER WRENCH
Edward L. Rogers, Westland, Mich., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed Feb. 24, 1969, Ser. No. 801,403
Int. Cl. B25b *13/00, 21/02*
U.S. Cl. 81—54 **4 Claims**



A power wrench including a motor driving a spindle mounted in an angle head and containing a device for measuring the depth of a fastener and creating a fluid signal upon arrival of the fastener at a predetermined depth. The wrench further contains a normally open valve operative to close in response to the signal thereby stopping the wrench motor when the fastener arrives at the predetermined depth.

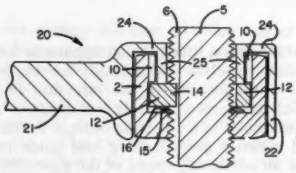
3,581,608
CUTTING AND STRIPPING APPARATUS FOR INSULATED CONDUCTOR WIRE
William J. Baker, Reed City, Mich., assignor to Gardner-Denver Company, Quincy, Ill.
Filed Nov. 5, 1969, Ser. No. 874,179
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.5 **8 Claims**



A cutting and insulation stripping apparatus for electrical

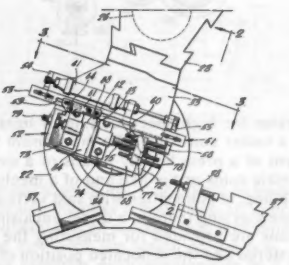
conductor wire adapted to mount on a portable conductor wrapping tool. The apparatus includes a frame pivotally supporting a pair of wire cutting blades and a pair of insulation cutting and stripping blades. Both pair of blades are operable to be engaged by an elongated cam shaft to which is attached an operating lever whereby a conductor wire may be simultaneously severed and have its insulation cut at a predetermined distance from the severed end. The insulation cutting blades overlap each other in the closed position to assure a circumferential cut of insulation around the wire. The insulation cutting blades are also operable to strip the cut insulation from the wire as the severed end is withdrawn from the apparatus. The pair of wire cutting blades are movably mounted on the frame whereby various predetermined lengths of stripped wire may be cut.

3,581,609
LOCK NUT ASSEMBLY AND BOLT AND WRENCH FOR USE THEREWITH
Eugene C. Greenwood, 468 Prospect Street, Newport Beach, Calif.
Filed Dec. 12, 1968, Ser. No. 783,311
Int. Cl. B25b *13/06*
U.S. Cl. 81—121 **12 Claims**



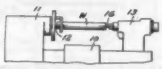
A lock nut assembly including a nut having a threaded hole therein adapted for use with a bolt having a groove running at least part of the length of the thread thereon. The nut comprises a central recess which includes a plurality of inwardly extending serrations along a portion of the total depth of the recess. A lock ring having a plurality of serrations extending outwardly from the outer surface thereof is adapted to fit over the bolt and into the recess in the nut where the serrations on the lock ring mate with the serrations on the nut. The lock ring further includes an inwardly extending tongue which is positioned in the groove in the bolt so that the lock ring is axially moveable but not rotatable relative to the bolt, the nut being locked in place when the serrations thereon are in contact with the serrations on the lock ring. A special wrench is provided for separating the lock ring and nut so that the nut may be rotated relative to the bolt.

3,581,610
ADJUSTABLE STOP
John E. Burke, Broomall; Edward J. Kaiser, Philadelphia, Pa., and Charles J. Myers, Woodbury, N.J., assignors to J. E. Lonergan Company, Philadelphia, Pa.
Filed May 26, 1969, Ser. No. 827,763
Int. Cl. B23b *5/46*
U.S. Cl. 82—5 **5 Claims**



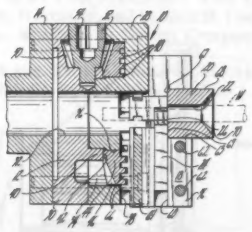
This patent discloses an attachment for an automatic lathe having a turret for mounting a series of tools which are operated in sequence automatically to produce a finished machined workpiece, in particular an attachment for a turret slide head having a tool mount which moves axially towards the chuck, and which at the forward end of its stroke, may be displaced laterally from its "home" position by a pusher mounted on a cross slide of the lathe. At the completion of the pusher stroke, the pusher retracts and the slide head is automatically returned to its "home" position, and it may be retracted axially of the chuck. In the illustrated slide head, a delay device retards the return of the head to its "home" position. This patent discloses a stop which permits automatic adjustment of the "home" position of the slide head to different settings in successive operations.

3,581,611
TAILSTOCKS
Rex A. Lentz, Rochester, Mich., assignor to The Babcock & Wilcox Company, NY, N.Y.
Filed July 25, 1969, Ser. No. 844,870
Int. Cl. B23b *23/00*
U.S. Cl. 82—31 **8 Claims**



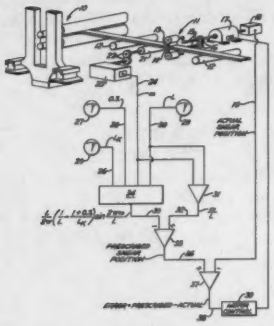
A tailstock comprising a base, a quill, and a work-supporting center rotatably mounted in the quill. First fluid-operated means are provided for moving the quill and the center toward the workpiece and second fluid-operated means are provided for moving the work center independently of the quill so that the work center can be forced toward the workpiece with a greater force in order to initially coin the end of the workpiece and thereafter the second fluid operated means will retain the workpiece in normal work-operating position.

3,581,612
CUTTING TOOL
Arthur E. Jackman, 42 Old Meadow Plain Road, Simsbury, Conn.
Filed Aug. 27, 1969, Ser. No. 853,287
Int. Cl. B23b *3/24*
U.S. Cl. 82—35 **9 Claims**



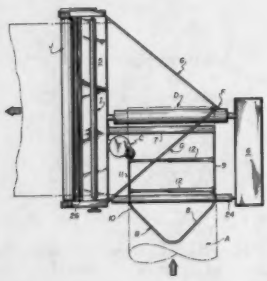
A rotatable cutting tool for turning axially elongated workpieces and having a plurality of circumaxially spaced radially movable jaws for clampingly engaging a cylindrical bushing having a coaxial bore for journaling a workpiece to be cut as it is advanced axially therethrough. Each jaw carries a cutter for engaging an advancing workpiece. Preferably, the bushing is selected from a plurality of bushings, each of the bushings corresponding to a selected workpiece to be cut and having a bore diameter equal to the major cross-sectional dimension of the workpiece. The outside and bore diameters of each of the bushings are so related that clamping a selected bushing between the jaws effects automatic adjustment of the cutters to produce a finish cut of predetermined diameter or configuration.

3,581,613
FLYING SHEAR CONTROL
Ronald Wesley Deems, Pittsburgh, Pa., assignor to United Engineering and Foundry Company, Pittsburgh, Pa.
Filed July 22, 1969, Ser. No. 843,328
Int. Cl. B23d 5/16
U.S. Cl. 83—76 5 Claims



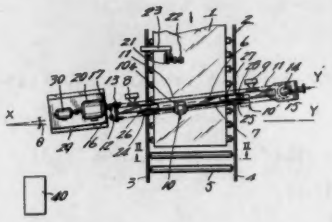
The disclosed flying shear control system operates on the principle of continuously positioning the shear knives as a sine curve function of the measured length of material passed through the shear in relation to the desired sheared length of material. Throughout each shearing cycle, the control system derives a prescribed shear position signal from signals representing the measured material length passed through the shear, desired sheared material length, shear knife travel distance between successive cuts, and amount of shear knife overspeed during shearing. The prescribed shear position signal is compared with an actual shear knife position to derive an error signal which is used to control the shear motor to reduce the error to zero continuously between successive cuts by the shear.

3,581,614
FABRIC TUBE SLITTER AND OPENER
Frank Catallo, Elmont, N.Y., assignor to Fab-Con Machinery Development Corporation, Paterson, N.J.
Filed Sept. 10, 1968, Ser. No. 758,918
Int. Cl. B26d 7/14
U.S. Cl. 83—175 7 Claims



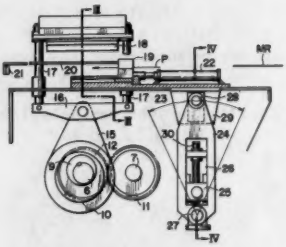
This invention is directed to a slitter and opener for fabric tubes in which the tube to be slit is drawn over a horizontal spreader past a power-driven slitter knife, thence vertically upwardly into engagement with opener devices and thence horizontally laterally as a flat open web to engagement over a driven discharge roll. The slitter knife is readily laterally adjustable and carries one arm of the entrance spreader so that the span of the spreader automatically conforms to the lateral setting of the slitter knife.

3,581,615
APPARATUS FOR AUTOMATICALLY CUTTING A GLASS RIBBON
Kenichi Kaneshige, and Yasuyuki Nagae, both of Osaka-Prefecture, Japan, assignors to Central Glass Co. Ltd., Ube, Yamaguchi-Prefecture, Japan
Continuation of application Ser. No. 715,899, Mar. 25, 1968, now abandoned. This application Nov. 13, 1969, Ser. No. 871,651
Int. Cl. B26d 1/56, 3/08
U.S. Cl. 83—295 14 Claims



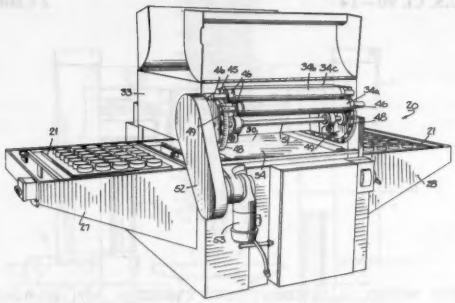
The present invention relates to an apparatus for automatically cutting transversely a continuously moving glass ribbon in a direction perpendicular to the direction of its moving pathway, which comprises a guide rail bridged across and above the glass ribbon in a direction oblique to the advancing pathway, and a cutter guided along said guide rail, characterized in that an advancing speed of the glass ribbon is electrically detected, and said cutter is driven to travel proportionally to said advancing speed so as to automatically cut said glass ribbon to predetermined lengths.

3,581,616
METHOD AND APPARATUS FOR HIGH SPEED CUTTING OF SHAPED STEEL
Nobuzi Kawae; Kenzi Terai, both of Kitakyushu, and Shoichi Tani, Tokyo, all of, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Sept. 16, 1968, Ser. No. 762,229
Claims priority, application Japan, Sept. 23, 1967, Sept. 23, 1967, 42/60835;42/60836
Int. Cl. B26d 1/56; B23d 25/04
U.S. Cl. 83—311 4 Claims



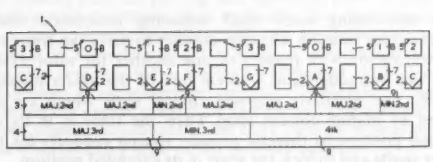
An apparatus for high speed cutting of light gauge steel, comprising a cutter consisting of a mechanism for the vertical movement of a press bed by means of a single or plural sets of eccentric cams or the like and of a mechanism for the reciprocal sliding, in connection with said vertical movement, of a slide base carrying thereon a dieset enclosing a blade for cutting. Means are provided for measuring the speed of the to-be-cut material and the dislocated position of the dieset at the time of cutting. These values are then fed to a means for adjusting the driving speed of the cutter, thereby ensuring that each cutting operation is carried out at the correct position.

3,581,617
ROLLER DIE CUTTING MACHINE OR THE LIKE
John W. Lysobey, Norwalk, Conn., assignor to Packaging Industries, Inc., Hyannis, Mass.
Filed Feb. 13, 1968, Ser. No. 705,069
Int. Cl. B26d 1/02
U.S. Cl. 83—512 15 Claims



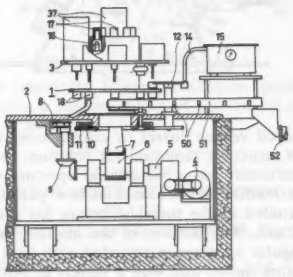
A roller die cutting machine in which one or more rollers are used to force a work piece and a die into a cutting engagement. A wear plate can be used to force the work piece against the cutting edges of the die in response to the movement of a roller along the wear plate. Where there is a succession of passes of a roller or rollers in engagement with the wear plate, the roller can be caused to apply an incrementally increasing cutting force to the work piece during each successive pass. One of the improvements to the roller die cutting machine is the provision of means to deform the work table upon which the cutting die is disposed in order to accommodate for the deflection of the roller under load and to insure uniform application of force by the roller against the work piece throughout substantially the entire length of the roller. In another improvement the roller is provided with a crowned longitudinal cross section in order that a substantially straight cylindrical form can be maintained at the portion of the roller engaging the wear plate when the roller is under load. The load deflecting the crowned roller causes it to assume a straight cylindrical form. In still another improvement provision is made for raising and lowering the work piece with respect to the path of travel of the roller or rollers and thereby enabling various sizes of dies and thicknesses of work pieces to be accommodated.

3,581,618
MUSICAL INTERVAL INDICATOR
Michel B. Perrault, 4200 Sherbrooke West, Apt. 20, Montreal 215, Quebec, Canada
Filed Sept. 15, 1969, Ser. No. 857,903
Claims priority, application Canada, Aug. 8, 1969, 059,046
Int. Cl. G09b 15/02
U.S. Cl. 84—477 4 Claims



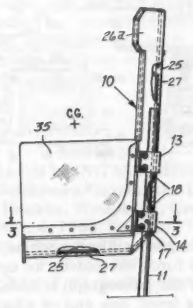
To enable musical intervals to be taught to young children, a musical indicator includes a body with an upper face having a row of equally spaced recesses, and a channel extending parallel to the row over the length of the row, a series of note-indicating elements each positionable in a recess and each representing a musical note, and a series of interval-indicating elements of different lengths positionable in the channel, the length of each interval-indicating element corresponding to the length of the musical interval it represents. Thus, once a scale has been set up by placing note-indicating elements in appropriate recesses, a child can readily determine the musical interval between adjacent notes by finding which interval-indicating element when fitted in the channel will extend from one note to the other. Similarly, by knowing the intervals between adjacent notes, a child can dispose the note-indicating elements in the appropriate recesses. Intervals between nonadjacent notes can also be determined in this way.

3,581,619
MACHINE FOR CONTINUOUSLY PRODUCING DETONATING CAPS, CONTAINING PRIMARY AND SECONDARY EXPLOSIVE CHARGES
Nicolas Makay, Rio De Janeriro, Brazil, assignor to F. G. Kretschmer & Co., Vaduz, Liechtenstein
Filed July 24, 1968, Ser. No. 747,243
Int. Cl. F42b 9/02, 33/02
U.S. Cl. 86—10 15 Claims



This invention is directed to a multistation, continuously operating, rotary machine for successively partly filling detonator cap casings first with a predetermined charge of secondary explosive and compressing same to a predetermined density and then completing the filling of the casings with a predetermined charge of primary explosive and compressing same to a predetermined density. The filled detonator caps are discharged through a cleaning unit and means are provided for detecting and ejecting faulty or imperfectly filled casings.

3,581,620
ARMORED SEAT FOR AIRCRAFT AND THE LIKE
Eldon W. Hauck, Worcester, and Samuel H. Coes, Northboro, both of, Mass., assignors to Norton Company, Worcester, Mass.
Filed Aug. 29, 1967, Ser. No. 665,669
Int. Cl. B64d 7/00; F41h 7/00
U.S. Cl. 89—36 10 Claims



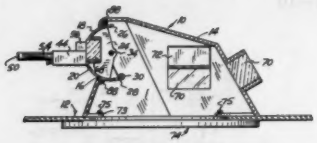
A laminar seat structure for aircraft or the like having a fiber glass resin with bonded refractory plates forming an ar-

mored seat structure adapted for adjustable attachment to conventional support means wherein advantage is taken of the high tensile and compressive strengths of the composite armor structure, in such a way that the tensile stresses imposed on the fiber glass are transmitted to the refractory plates in a manner to take advantage of the high compressive strength characteristic of the plates so that the two strength characteristics of the materials are used to balance one another.

3,581,621
ARMORED VEHICLE TURRET

Russell E. Bauer, Grosse Pointe, Mich., assignor to KDI-Bauer Corporation, Warren, Mich.

Filed July 19, 1968, Ser. No. 746,130
Int. Cl. F41f *21/16*; F41h *5/20*
U.S. Cl. 89—36 **6 Claims**

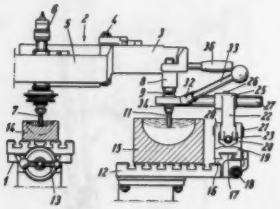


An armored vehicle turret or cupola comprising a bullet impervious structure mounted for rotation about a vertical axis. The structure has a rectangular aperture which is obturated by a mantlet shaped as a hollow partially cylindrical shield journaled in the turret structure for rotation about a horizontal axis. The portion of the mantlet projecting from the rectangular aperture is provided with light firearm ports and mounting means and with a variety of ports and mounting means for diverse devices adapted to discharge liquids or gases to the exterior of the vehicle. The mantlet is spring equilibrated in such manner that it can easily be actuated in elevation by simple manual means.

3,581,622
PATTERN CONTROLLED MILLING MACHINE WITH A PANTOGRAPH AND A LINE SCANNER

Hans Maass, Bad Lauterberg/Harz, and Albert Bottcher, Scharzfeld/Harz, both of, Germany, assignors to Franz Kuhlmann K.G, Pragisionsmechanik und Maschinenbau, Wilhelmshaven, Germany

Filed May 22, 1969, Ser. No. 826,872
Claims priority, application Germany, May 24, 1968, P 17 52 423.1
Int. Cl. B23c *1/16*
U.S. Cl. 90—13.1 **4 Claims**

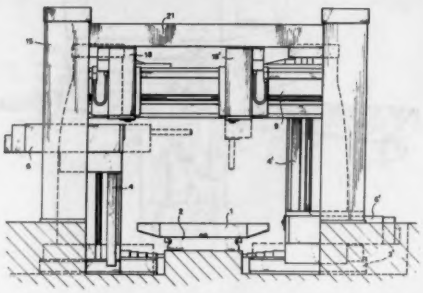


In a pattern controlled milling machine including a pantograph, the manual force exerted by an operator for guiding the tracer point of the pantograph is transmitted to the pantograph by a guide lever, one end of which carries a handle for manual engagement, the other end of which is swingably supported. The free end of the pantograph carries said tracer point and is swingably attached to the guide lever between its two ends.

3,581,623
MILLING-BORING MACHINES

Maso Galbarini, Pavia, Italy, assignor to Innocenti Societa Generale Per L'Industria Metallurgica E Meccanica, Milan, Italy

Filed Apr. 7, 1969, Ser. No. 814,039
Claims priority, application Italy, Dec. 27, 1968, 54450A/68
Int. Cl. B23c *1/10*; B23d *39/02*
U.S. Cl. 90—14 **2 Claims**

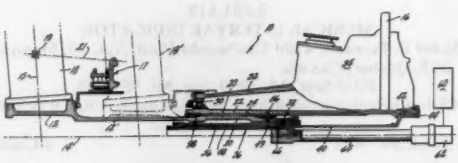


A portal-type milling-boring machine has two columns disposed on opposite sides of a bed over which a workpiece-supporting table moves, a beam extending between the two columns over said bed. Working heads are carried by the columns and the beam for effecting different machining operations on a workpiece, and the columns are movable on respective transverse guides parallel to the axis of the beam to vary the effective width of the portal. This enables boring operations to be effected on the sides of the workpiece by the working heads carried by the columns. Suspensions are provided for transmitting the weight of the beam and the heads carried thereby to fixed auxiliary columns.

3,581,624
TELESCOPING ROTOR SHAFT

Robert A. Stone, Stratford, Conn., and Frederick C. Beurer, Hamden, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 30, 1969, Ser. No. 837,448
Int. Cl. F15b *15/26*
U.S. Cl. 91—44 **13 Claims**



A telescoping rotor shaft including concentric shafts mounted for rotation with one another to drive the rotor and for translation with respect to one another for rotor extension and retraction and wherein one of the shafts includes spaced and angularly opposed conical seats which are engaged by mating conical rings when the rotor is in its extended position to thereby provide spaced supports for the rotor shafts and to lock the shaft in its extended position.

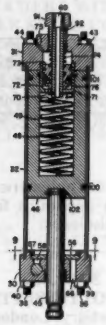
3,581,625
IMPACT CYLINDER

Stanley Joseph Michalak, 9231 S. Cedar Drive, West Olive, Mich.

Filed Mar. 12, 1969, Ser. No. 806,551
Int. Cl. F15b *15/26*
U.S. Cl. 91—45 **5 Claims**

A pneumatic impact cylinder with a piston latch operable

to restrain the piston until predetermined pressure develops on the side of the piston associated with generating impact



movement, the said latch being operable to release said piston in direct response to the said pressure.

3,581,626

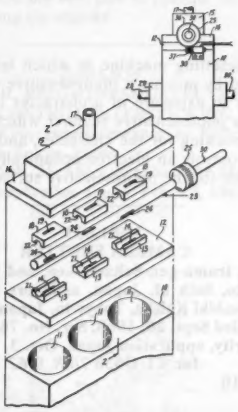
ADJUSTABLE ADMISSION VALVE MEANS FOR STEAM ENGINES AND THE LIKE

Daniel S. Matthews, 513 Ford Road, Sacramento, Calif.

Filed May 5, 1969, Ser. No. 821,695

Int. Cl. F01l *33/02, 31/20*

U.S. Cl. 91—180 **9 Claims**



A plural piston steam engine has steam admission ports leading to the cylinders and a rotary admission valve element has transfer ports for placing said admission ports in communication with the steam chest cyclically. The several transfer ports are spaced circumferentially on the admission valve element in a predetermined relation. A planetary transmission gear unit coupled to the rotary admission valve element establishes a predetermined constant reduction of speed between the engine crankshaft and rotary valve element and allows angular adjustment of the valve element to provide engine reversal and a dead center no-work position.

3,581,627

AIR AND SPRING BRAKE STRUCTURE

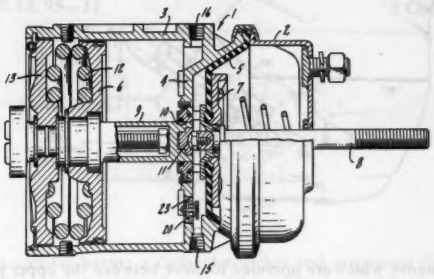
Sergio Campanini, Lincolnwood, Ill., assignor to Berg Mfg. & Sales Co., Des Plaines, Ill.

Filed July 16, 1969, Ser. No. 842,253

Int. Cl. F01b *7/00*

U.S. Cl. 92—63 **2 Claims**

An air and spring brake chamber including means permitting transfer of air pressure from the service chamber to the emergency chamber to resist the action of the spring in the emergency chamber and simultaneously to urge the service chamber elements toward brakes-on position, said means preventing a compounding of service air and spring forces toward brakes-on position.



3,581,628

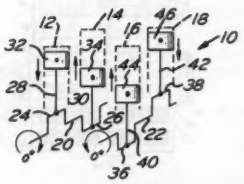
INHERENTLY BALANCED RECIPROCATING POWER PLANT

Thomas V. Williams, 415 Dreshertown Road, Fort Washington, Pa.

Filed Dec. 4, 1969, Ser. No. 882,243

Int. Cl. F01b *1/02*

U.S. Cl. 92—73 **9 Claims**



A reciprocating powerplant is disclosed wherein cylinders are disposed in groups of four, with cylinders in each group disposed in side-by-side relation in two parallel rows. Crankshafts associated with the respective rows are parallel and are interconnected for counterrotation, and have cranks so disposed that the pistons in diagonally adjacent cylinders in the respective groups and rows move in the same direction and are at corresponding positions in their travel at any given time.

3,581,629

BAGMAKING MACHINE

Karl Wiendieck, Sutthausen/Osnabruck, Germany, assignor to Windmolle & Hostche, Westphalia, Germany

Filed Nov. 4, 1968, Ser. No. 773,079

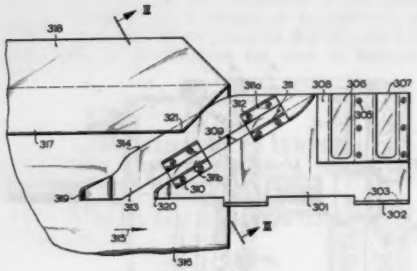
Claims priority, application Germany, Nov. 6, 1967, P 16 11 707.0

Int. Cl. B31b *1/92;* **B65b** *57/04, 65/08*

U.S. Cl. 93—8 **5 Claims**

A deflector is disposed between the bottom laying and delivery stations and is controlled by bottom checking devices to reject defective bags from the path of travel. The sensing elements for the path of travel of the inner halves of

the bag end portions consist of photodetectors for receiving reflected light, which cooperate with stationary reflecting

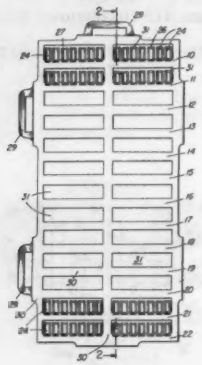


elements, which are intended to enter between the upper ply of the bag and the bag bottom.

3,581,630
PLASTIC SKI TRACK

Francis F. Del Piano, 32 E. 68th St., New York, N.Y., and Tino Cazzaniga, Via Zava Hari, Monza, Italy

Filed Aug. 9, 1968, Ser. No. 751,617
Int. Cl. E04c *1/24*
U.S. Cl. 94—3 **8 Claims**



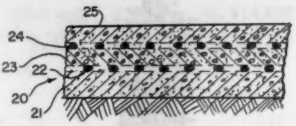
The specification describes a plastic ski track composed of interlocking track elements roughly rectangular in shape. Each track element contains a plurality of parallel rows of upright support members inclined from the vertical at an angle in the direction of the ski course. The elements may be fabricated by injection molding of a plastic composition, such as polyethylene-based compound.

3,581,631
MANUFACTURE OF FILM REINFORCED BITUMINOUS STRUCTURES

Sigbert Samson, Rozendaal, and Jacobus P. Van Der Ploeg, Gelp, both of, Netherlands, assignors to American Enka Corporation, Enka, N.C.

Filed May 13, 1969, Ser. No. 824,084
Claims priority, application Netherlands, May 16, 1968, 6,806,899
Int. Cl. C09j *3/30*
U.S. Cl. 94—23 **13 Claims**

A process for the manufacture of a film reinforced bituminous structure including at least one bitumen-containing layer which comprises the steps of applying a polymeric adhesive film containing synthetic threads and thereafter applying a molten layer of bitumen-containing material to the film so that the adhesive will soften and promote adhesion between the two layers of material and the synthetic threads. The film is formed of a plurality of synthetic reinforcing threads, e.g. a fabric of polyester threads, having spaces

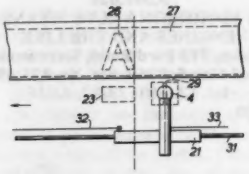


therebetween filled with the polymeric adhesive, e.g. montan resin. A process and an apparatus for forming the thread containing film are also disclosed.

3,581,632
PHOTOTYPESETTING

Norman John Gatter, Norbury, London, England, assignor to Triggs & Gatter Limited, London, England

Filed Nov. 14, 1968, Ser. No. 775,743
Int. Cl. B41b *15/04*
U.S. Cl. 95—4.5 **19 Claims**

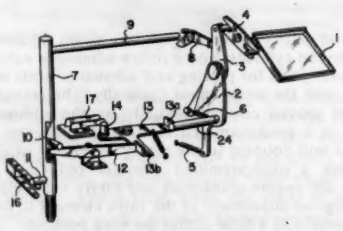


A phototypesetting machine in which letter-spacing control is effected by moving a photosensitive surface a desired distance prior to exposure of a character in response to an output from a photosensitive scanner which scans an image of a control marking for the character, and the output from the scanner controls an electromechanically operated transport mechanism for the photosensitive surface.

3,581,633
CAMERA SHUTTER

Naoyuki Uno, Iruma-gun-Saitama-ken, and Katsuhiko Nomura, Tokyo-to, both of, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

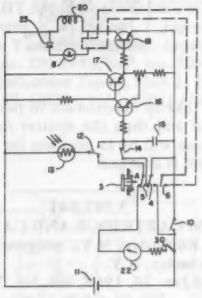
Filed Sept. 26, 1968, Ser. No. 762,853
Claims priority, application Japan, Oct. 3, 1967, 42/83746
Int. Cl. G03b *7/08, 9/62*
U.S. Cl. 95—10 **9 Claims**



An electrically timed camera shutter includes a timing and switching network connected to an energizing battery through a pair of parallel normally open first and second switches. The first switch is closed by the shutter opening release button which also unlatches a spring actuated lever which closes the second switch. The lever is retracted with the initiation of the shutter closing to open the second switch. The network energizes and deenergizes a solenoid for holding open and releasing the shutter to its closed position and in an alternative arrangement instead of a lever, a sole-

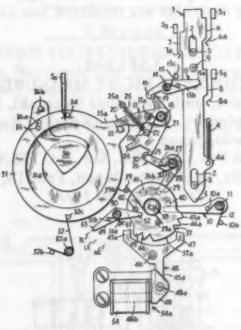
noid energized by the network output controls the second switch.

3,581,634
PHOTOGRAPHIC CAMERA WITH AN ELECTRONIC SHUTTER SPEED CONTROL
Wolfgang Ort, Stuttgart-Bad Cannstatt, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 4, 1968, Ser. No. 773,120
Claims priority, application Germany, Mar. 21, 1968, P 17 72 019.3
Int. Cl. G03b *7/08, 9/08*
U.S. Cl. 95—10 **3 Claims**



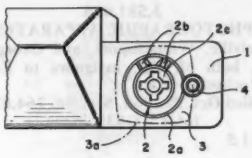
A preindicator for an electromagnetically controlled shutter having a lamp connected to the electromagnet so as to glow when the electromagnet is energized. Also provided is a switch to enable the operator to operate the shutter control without opening the shutter.

3,581,635
AUTOMATIC BRIGHTNESS DETECTION AND EXPOSURE CONTROL INTERLOCKING DEVICE
Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattou Tokeiten, Tokyo, Japan
Filed Feb. 25, 1969, Ser. No. 801,989
Claims priority, application Japan, Feb. 28, 1968, 43/12429
Int. Cl. G01j *1/00*
U.S. Cl. 95—10 **10 Claims**



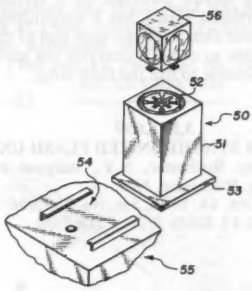
A camera is equipped with apparatus including an electric circuit for sensing the brightness of a selected subject to be photographed and indicator means visible to the camera operator and including a pointer arm automatically movable to either one of three positions depending upon the degree of brightness of the selected subject. The apparatus includes mechanism for moving the pointer arm into one of the three positions in response to the sensing of the brightness of the selected subject.

3,581,636
PHOTOGRAPHIC CAMERA WITH BUILT-IN FLASH DEVICE FOR FLASH CUBES AND FLASH SOCKET FOR SEPARATE FLASH DEVICES
Helmut Ettischer, Ruit/Kreis Esslingen, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 15, 1968, Ser. No. 744,785
Int. Cl. G03b *19/00*
U.S. Cl. 95—11 **2 Claims**



A camera having a flashcube socket and a separate flash device socket adjacent each other. The two sockets are closely located so that, owing to the large lateral dimensions of the flashcube relative to the size of its socket, normal use of either socket prevents normal use of the other socket.

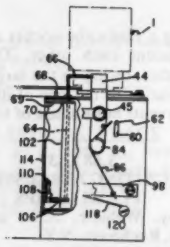
3,581,637
DEVICE FOR IGNITING PERCUSSION-IGNITABLE FLASH LAMPS
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 14, 1968, Ser. No. 767,348
Int. Cl. G03b *19/00*
U.S. Cl. 95—11 **5 Claims**



A device is provided for igniting a percussion-ignitable flashlamp in use with photographic apparatus such as a camera, the device comprising a socket to receive a flash unit including a percussion-ignitable lamp, an actuating member movable into contact with such a unit received in the socket to ignite the lamp, and electromagnetic means, such as a solenoid, for effecting movement of the actuating member into contact with the unit, so that the lamp is ignited in response to energization of the electromagnetic means. The device may be connected to the photographic apparatus or it may be located remotely from the apparatus and used as a slave flash device. The electromagnetic means may be energized by electrical energy received through electrical conductors connected to the apparatus or by signal energy, such as light, radio frequency energy, or a sonic signal, transmitted from the apparatus. The electromagnetic means may move the actuating member directly into contact with the flash unit or it may release the actuating member for movement by a spring or other biasing means into contact with the unit. The actuating member may percussively contact the lamp itself or it may contact a striking member on the received flash unit to move the striking member into percussive contact with the lamp. The socket of the device may be adapted to receive a multilamp flash unit having a plurality of percussion-ignitable flash lamps, and means may be provided in the device for rotating such a socket in response to energization of the elec-

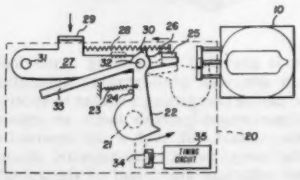
tromagnetic means. The socket may conveniently be adapted to receive alternatively a percussion-ignitable flashlamp unit and an electrically ignitable flashlamp unit, in which case a pair of electrical contacts connected electrically in parallel with the electromagnetic means and connectable to an electrically ignitable flashlamp of a unit received in the socket may be provided to effect ignition of an electrically ignitable lamp in response to energization of the electromagnetic means.

3,581,638
PHOTOGRAPHIC APPARATUS
William T. Colville, Williamsport, and George W. Parsons, Hughesville, both of, Pa., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 3, 1968, Ser. No. 764,878
Int. Cl. G03b *15/04*
U.S. Cl. 95—11.5 **7 Claims**



A camera for receiving a photoflash lamp ignitable by striking, for example, a percussive type of photoflash lamp, is fired by a striking device powered by a torsional spring. Preferably, the torsional spring has a longitudinal axis and two laterally disposed ends with one such end of the torsional spring being movable to cock or energize the spring and the other end being movable to fire the flash lamp.

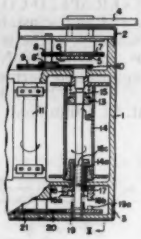
3,581,639
SHUTTER SYNCHRONIZED FLASH UNIT
Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 14, 1968, Ser. No. 767,096
Int. Cl. G03b *9/70*; **F21k** *5/00*
U.S. Cl. 95—11.5 **2 Claims**



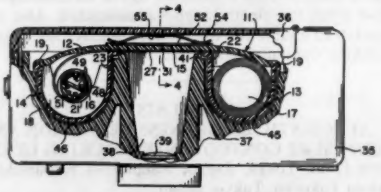
A camera for taking photographs using the illumination of a percussion-fireable flash lamp in which a portion of the shutter itself strikes the ignition tube or other firing means of the flash lamp for ignition thereof.

3,581,640
FILM ADVANCING MECHANISM FOR FILM ROLL CAMERAS HAVING DELAYED CLUTCH ACTION
Shuji Kimura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Mar. 13, 1968, Ser. No. 712,670
Claims priority, application Japan, Mar. 23, 1967, 24024
Int. Cl. G03b *9/68*
U.S. Cl. 95—31 **4 Claims**

A film takeup arrangement is provided for a still camera in which the film leader of a roll film loaded into the camera is wound upon the takeup spool before the shutter charging mechanism of the camera is activated. A clutch mechanism is provided which is interlocked with the camera cover, the closing of the camera cover initiating a delayed clutch engagement of the takeup mechanism to permit the film leader to be first wound and then the shutter mechanism charged. The first film frame will be in position for exposure when the shutter mechanism is charged.

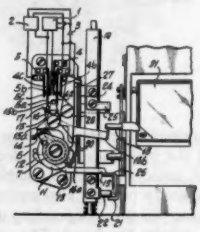


3,581,641
FILM CARTRIDGE AND CAMERA
Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 24, 1968, Ser. No. 700,056
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 **12 Claims**



A camera-cartridge apparatus for locating an exposure frame of the film accurately in the focal plane of the camera lens system. By having the focal plane determining means of the camera directly contact the emulsion surface of the film rather than a body part of the cartridge, the fabrication tolerances of the cartridge are rendered less critical.

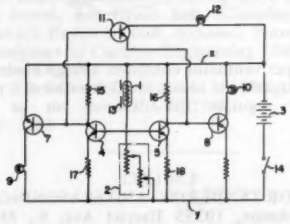
3,581,642
THROUGH-THE-LENS LIGHT MEASURING SYSTEM
Katsuhiko Nomura, and Tadazumi Sakazaki, both of Tokyo-to, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Nov. 25, 1968, Ser. No. 778,530
Claims priority, application Japan, Feb. 15, 1968, 9565
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **8 Claims**



A through-the-lens measuring system in a single lens reflex camera includes through-the-lens light measuring networks

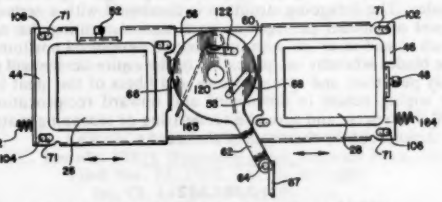
for fully open and reduced apertures a battery and a pair of double-throw switches, each resiliently closed to one contact thereof. One switch has its contacts interconnected and is connected between the battery and the networks and the contacts of the other switch are connected to respective network terminals so as to alternatively actuate the networks. A self timer includes a winding shaft and a winding member connected thereto by a lost motion coupling. A switch actuating lever is operated by the winding member in the lost motion movement to alternatively close selected contacts of each switch and thereby energize and actuate a selected network.

3,581,643
LIGHT MEASURING DEVICE
Hirofumi Yoshimura, Okaya-shi, Japan, assignor to Kabushiki Kaisha Yashica, Tokyo-to, Japan
Filed Apr. 29, 1968, Ser. No. 725,111
Claims priority, application Japan, May 2, 1967, 42/36,363
Int. Cl. G03b *19/12*; G01j *1/00*
U.S. Cl. 95—42 **10 Claims**



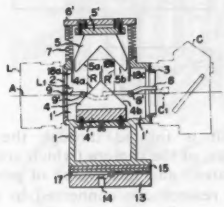
A light measuring device includes a photoconductor and variable resistor series connected to a battery. The voltage across the variable resistor is applied to the input of a pair of amplifiers each of which includes an input switching transistor having emitter and collector resistors, and an output transistor with an output energizing a signal lamp. Another transistor has its input connected between the switching transistor collectors and its output to a third lamp. The ratio of the resistances of the collector and emitter resistors are different so that the switching transistor stages respond to different level signals and the output transistors are of opposite types.

3,581,644
COMBINED VIEWFINDER-RANGEFINDER
Philip G. Baker, Norwood, and John R. Sharp, North Quincy, both of, Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Aug. 9, 1968, Ser. No. 751,486
Int. Cl. G03b *3/00*
U.S. Cl. 95—44 **12 Claims**



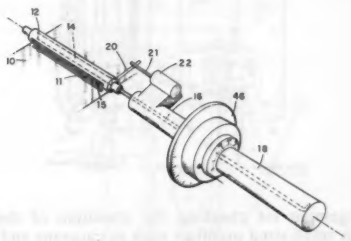
A full-field viewfinder-rangefinder of the coincident type for a photographic camera is disclosed. A single cam is operable to cause coincidence of a pair of superposed images at predetermined focus settings of the camera. The cam also adjusts framing elements in the device so the frame size is related to the camera's field and also to correct parallax.

3,581,645
MACROPHOTOGRAPHIC ATTACHMENT WITH VERTICAL OPTICAL AXIS
Kunihiko Hori, Kawasaki-shi, Kanagawa-ken, and Yutaka Saito, Tokyo, both of, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Filed Oct. 1, 1968, Ser. No. 764,137
Claims priority, application Japan, Oct. 11, 1967, 42/65066
Int. Cl. G03b *3/06*
U.S. Cl. 95—45 **3 Claims**



A macrophotographic device is provided for a single lens reflex camera provided with interchangeable lenses in the form of an adapter for taking closeup photographs at various magnifications. Two fixed reflecting surfaces at right angles to each other and two reflecting mirrors at right angles to each other and movable in unison, are provided in the light path between the objective and the film for increasing or decreasing the optical path without changing the distance between the objective and the film.

3,581,646
FAST-ACTING TUBULAR SHUTTER
Allan M. Saunders, San Mateo, and Ronald J. Fleming, San Jose, both of, Calif., assignors to Technical Operations, Incorporated, Burlington, Mass.
Filed July 12, 1968, Ser. No. 744,414
Int. Cl. G03b *9/08*
U.S. Cl. 95—53 **9 Claims**

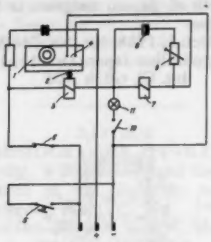


A cylindrical tube is rotatable about its axis and is provided with diametrically arranged slits for registering with a slit in a mask for allowing a beam of light to pass for a selected period of time. The shutter is driven by a cylindrical torsion spring and apparatus is provided for varying the time delay before opening, the rate of travel during opening, and the shutter open time.

3,581,647
RELEASING DEVICE FOR CAMERAS WITH AUTOMATIC FILM ADVANCE
Herbert Maronde, Dusseldorf, Germany, assignor to Robot Foto and Electronic GmbH 4 Co., KG, Dusseldorf, Germany, a part interest
Filed June 12, 1968, Ser. No. 736,373
Claims priority, application Germany, June 19, 1967, P 15 97 378.1
Int. Cl. G03b *9/00*
U.S. Cl. 95—53E **3 Claims**

A relay is employed which has normally open contacts and normally closed contacts. A first series electrical circuit is

formed from a source of electrical power through a manually operable switch, the normally closed contacts, and a solenoid for actuating the camera release button. A second series



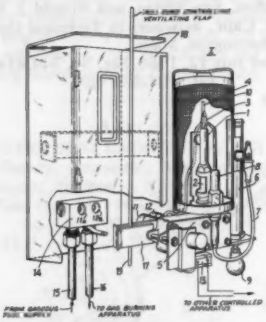
electrical circuit is formed through the relay coil, the flashlight contacts of the camera (which are closed when the shutter is operated) and the source of power. A capacitor and adjustable resistor are connected in series across the relay coil. The normally open relay contacts are connected in a series circuit with a signal light and the source of power.

3,581,648

ARRANGEMENT FOR CHECKING THE CONDITION OF THE AIR ENCLOSED IN SMALL-SIZED PREMISES SUCH AS CARAVANS AND VENTILATING SAME

Raymond Bernard Faure, 10 Blvd. d'Inkermann, Neuilly-sur-Seine 92, France

Filed May 5, 1969, Ser. No. 821,781
Claims priority, application France, June 28, 1968, 157,119
Int. Cl. F24f *13/00*
U.S. Cl. 98—32 **4 Claims**



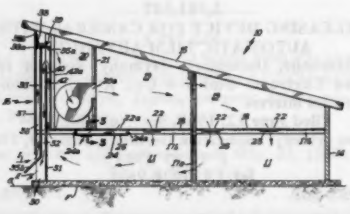
Arrangement for checking the condition of the air enclosed in small-sized premises such as caravans and ventilating same.

3,581,649

SOLAR HEATING AIR CHANGING WALL STRUCTURE

George W. Rauenhorst, Olivia, Minn.

Filed Apr. 14, 1969, Ser. No. 815,621
Int. Cl. F24f *13/00*
U.S. Cl. 98—33 **9 Claims**



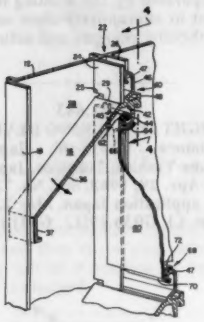
A wall structure of a building in which heat is exchanged between exhaust air and intake air.

3,581,650

COMBINATION AIR DAMPER

Francis J. McCabe, P. O. Box 131, Penns Park, Pa.

Filed May 8, 1969, Ser. No. 822,873
Int. Cl. F24f *13/08*
U.S. Cl. 98—110 **11 Claims**



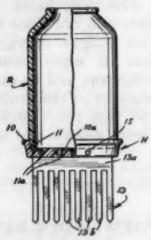
An air damper ventilator combines a fixed blade ventilator with means adaptable to check the flow of air in a plurality of directions or regulate the flow of air as it passes therethrough.

3,581,651

DEVICE FOR TENDERING AND SEASONING MEAT

Donald E. Johnson, 10355 Harriet Ave. S., Minneapolis, Minn.

Filed Aug. 4, 1969, Ser. No. 847,105
Int. Cl. A22c *9/00*
U.S. Cl. 99—254 **5 Claims**



A device for simultaneously tenderizing and interspersing seasoning and tenderizing materials in meat, which employs a body having a combination handle and reservoir for seasoning and tenderizing materials on the top thereof and which includes a rigid head having sockets or the equivalent for detachably receiving a multiplicity of prongs or penetration blades. The foregoing structure is combined with a series of liquid or powder passages or ports communicating the contents of said reservoir with the side and peripheral portions of the blades whereby reciprocation of the entire device will not only penetrate and spread tissues and fibers of the meat but, by wiping action in downward and upward reciprocations, will intersperse and spread a tenderizing or seasoning material throughout the thickness of the meat.

3,581,652

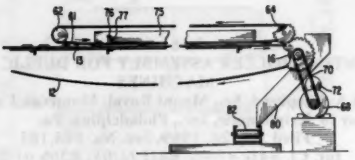
APPARATUS FOR PROCESSING SHRIMP

John A. Chauvin, 1313 Jefferson, Gretna, La.

Filed Nov. 7, 1967, Ser. No. 681,128
Int. Cl. A47j *43/18;* **A23c** *25/08*
U.S. Cl. 99—334 **13 Claims**

Shrimp processing wherein two overlying endless conveyor belts receive shelled shrimp therebetween and convey them through a steam cooking zone. The upper conveyor belt is provided with weights for urging it downwardly into engage-

ment with the shrimp to maintain the shrimp in substantially straight condition during cooking. The conveyors travel in synchronism with each other preferably at a speed which is



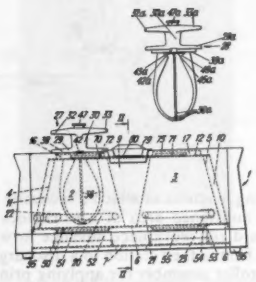
variable in accordance with the temperature at the cooking zone. After leaving the cooking zone, the shrimp are conveyed through a cooling zone and then finally to a grading or other processing conveyor.

3,581,653

COOKERS FOR COOKING EGGS

Kenneth J. Boyer, Camberley; John Patrick Raymond Bell, Hayling Island, and Grace Bell, Administratrix, of said John Patrick Raymond Bell, deceased, Putney, all of, England, assignors to Carillon Engineering Limited, Camberley, Surrey, England

Filed Dec. 23, 1968, Ser. No. 786,192
Int. Cl. A47j *29/02*
U.S. Cl. 99—332 **12 Claims**



An electrical cooker for cooking poultry eggs in their shells without water comprises an open-topped cooking chamber with a radiant electrical heating element and a holder for an egg which is arranged to be inserted into the chamber through the open top. The holder comprises a part which forms a closure for the chamber and three or more depending fingers which are spring-loaded towards each other and arranged to hold an egg between them. Above the closure part is a manually operable button depression of which opens the fingers apart from each other to allow an egg to be inserted between them or to allow a cooked egg to be deposited by the holder into an egg cup. Preferably the cooking chamber is of upwardly tapering truncated conical shape and the heating element is ring-shaped and is in the lower part of the chamber where it surrounds the lower part of the egg while it is being cooked.

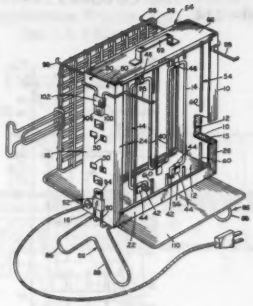
3,581,654

VERTICAL ELECTRIC GRILL UNIT

John C. Tescula, 22810 Westwood Road, Fairview Park, Ohio

Filed Nov. 14, 1969, Ser. No. 876,693
Int. Cl. A47j *37/08;* **H05b** *3/06*
U.S. Cl. 99—399 **5 Claims**

An electric grill for grilling foodstuffs and the like comprising a first generally U-shaped frame member having a bottom wall and vertically extending end walls with the top and sides of the member being open. Flanges extend inwardly from the marginal edges of the bottom and sidewalls and a second frame member of generally rectangular configuration with open sidewalls is positioned within the first frame member and spaced a short distance therefrom. A resistance heating element is carried by the second frame member generally centrally thereof and grid members are positioned across the



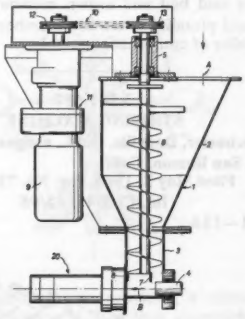
open sides of the first frame member and slidably received on its flanges. Additionally, leg and food support assemblies are removably connected to the first frame member.

3,581,655

PRESS FOR MANUFACTURING CYLINDRICAL OBJECTS FROM LOOSE FIBROUS OR PARTICULATE MATERIAL

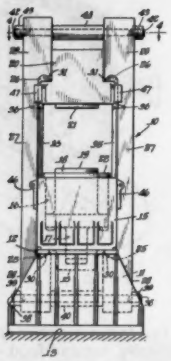
Fred Hausmann, Basel, Switzerland, assignor to Glomera A.G., Basel, Switzerland

Filed July 7, 1969, Ser. No. 839,607
Claims priority, application Great Britain, July 18, 1968, 34414/68
Int. Cl. B30b *15/08*
U.S. Cl. 100—97 **7 Claims**



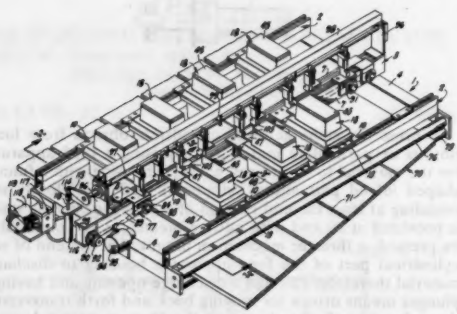
A press for manufacturing cylindrical objects from loose fibrous or particulate material comprising a feed apparatus for the material to be pressed having a housing with a funnel-shaped infeed part and a cylindrical feed part closely surrounding at least the end portion of a conveyor means which is provided at its end with cutting means for the material to be pressed; a thruster mechanism mounted at the end of said cylindrical part of the feed apparatus housing to discharge material therefrom through a discharge opening and having a plunger means driven for moving back and forth transversely through said cylindrical part of the feed apparatus housing thereby alternately blocking and freeing the outlet opening of said cylindrical part of the feed apparatus housing; and a cylindrical die mounted at said discharge opening in alignment with said plunger means.

3,581,656
PRESTRESSED PRESS
Lambros Pappas, and Eugene E. Grankowski, both of Chicago, Ill., assignors to Verson Allsteel Press Company, Chicago, Ill.
Filed June 11, 1969, Ser. No. 832,193
Int. Cl. B30b *15/04*
U.S. Cl. 100—214 **15 Claims**



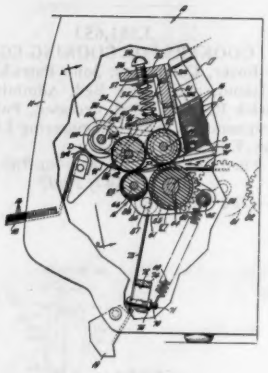
A prestressed press, including a bed member, a crown member and a ram carried by one of said members for performing a work function between the ram and the other of said members, is provided with a plurality of downwardly facing saddles on the bed member and a plurality of upwardly facing saddles on the crown member. A plurality of tension members extend between and along the sides of the bed member and the crown member beyond the saddles thereon and they have offsets therein respectively engaging the downwardly facing saddles on the bed member and the upwardly facing saddles on the crown member. A plurality of compression members are interposed between the bed member and the crown member, and shim means are arranged between the plurality of compression members and at least one of said bed and crown members for maintaining tension in said plurality of tension members and compression in said plurality of compression members.

3,581,657
STRIPING MACHINE
Marlin A. Schueler, Danville, Calif., assignor to Unimark Corporation, San Ramon, Calif.
Filed May 2, 1968, Ser. No. 726,111
Int. Cl. B41f *15/08*
U.S. Cl. 101—114 **4 Claims**



An electrostatic continuous printer having a stationary screen and powder supply and powder feed means respectively for supporting a supply of printing powder for transfer in a metered amount to said feed means, and for feeding the powder so transferred into an electrostatic field in an air gap disposed between the screen and the material to be printed upon for conducting the powder onto said material.

3,581,658
PRINTING ROLLER ASSEMBLY FOR DUPLICATING MACHINES
Robert A. Shepherd, Sr., Mount Royal, Montreal, Canada, assignor to Scriptomatic, Inc., Philadelphia, Pa.
Filed July 28, 1969, Ser. No. 845,185
Int. Cl. B41c *47/46;* **B41f** *11/08;* **B30b** *03/04*
U.S. Cl. 101—132 **14 Claims**

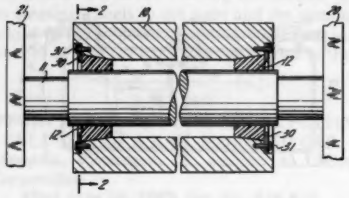


A duplicating machine in which a facsimile of indicia is imprinted on a moistened area of a workpiece from a master card as the card and workpiece advance forwardly through a printing zone from a feed station to a discharge station is provided with a roller assembly for applying printing pressure in successive stages in the printing zone. Printing pressure is applied in a first stage adjacent the feed station and between a printing roller and an advancing roller respectively overlying and underlying the path of movement of the card and workpiece, and printing pressure is applied in a second stage adjacent the discharge station by a similarly disposed set of rollers. In the first stage, the printing roller is mounted for pivotal movement on the fixed axis of the printing roller in the second stage and spring biased downwardly toward its associated advancing roller which has a fixed axis, and in the second stage the advancing roller is mounted for pivotal movement in the fixed axis of the advancing roller in the first stage and is spring biased upwardly toward its associated printing roller, which has a fixed axis, to frictionally drive the printing rollers at substantially equal velocities as the card and workpiece advance therebetween. In addition, the printing rollers are coated with a layer of tetrafluoroethylene to obviate their normal tendency to accumulate carbon particles from the master card and transfer them to the workpiece.

3,581,659
INSULATED ROTOGRAVURE BACKUP CYLINDER
Jack Bryer, Paramus, N.J., assignor to R. Hoe & Co. Inc., New York, N.Y.
Continuation-in-part of application Ser. No. 689,145, Dec. 8, 1967, now abandoned. This application July 24, 1969, Ser. No. 844,508
Int. Cl. B41f *9/00*
U.S. Cl. 101—153 **6 Claims**

A rotogravure backup cylinder having an outer metal sur-

face electrically insulated from its inner metal shaft by a

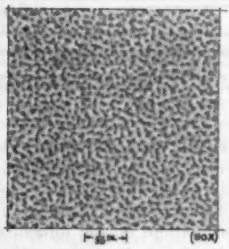


sleeve of nonconductive material.

3,581,660
LITHOGRAPHIC PRINTING PROCESS

Sidney L. Rapoport, and Douglas F. Mitchell, both of New York, N.Y., assignors to Rapoport Printing Corporation, New York, N.Y.

Filed Dec. 18, 1968, Ser. No. 784,836
Int. Cl. B41m *1/18;* **G03f** *5/24*
U.S. Cl. 101—450 **22 Claims**



A method for producing lithographic reproductions having outstanding tonal fidelity is disclosed. The new method includes the making of master and secondary printing plates from photographic images of the original copy and sequentially and in registry printing with each printing plate. Both printing plates are formed by photoengraving techniques from separate photographic negatives, each obtained by photographically exposing the original copy through a screen having an image disrupting surface pattern. The screen utilized in producing the master printing plate is a conventional square grid halftone screen, while that used in making the secondary negative has a fine irregular surface pattern.

3,581,661
ELECTROSTATICALLY IMAGED LITHOGRAPHIC PLATE

Irving Flechner, Stamford, Conn., assignor to Sperry Rand Corporation, New York, N.Y.

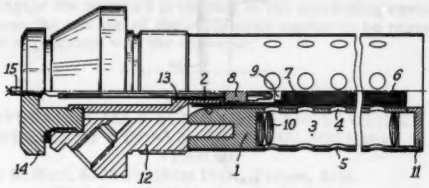
Filed Apr. 3, 1968, Ser. No. 718,368
Int. Cl. B41n *1/00, 3/00, 5/00*
U.S. Cl. 101—462 **4 Claims**

The disclosed electrostatically imaged lithographic plate employs a conductive paper substrate to which is applied a top coat consisting of photoconductive zinc oxide particles dispersed in a resin binder system comprising a synergistic mixture of a styrenated alkyd resin, a polyvinyl methyl ether homopolymer resin, and either a low molecular weight polystyrene resin or a low molecular weight petroleum hydrocarbon resin. The plate is imaged electrostatically, developed and then subjected to an improved conversion etch solution designed to render the nonimage areas of the plate hydrophilic; the image areas remaining hydrophobic and oleophilic.

3,581,662
SOLID PROPELLANT IGNITER

Robert Omer Emmanuel Grebert, Poudrerie Nationale De St-Medard, France, assignor to Etat Francais, represente par Le Ministre des Armees, Delegation Ministerielle pour L'Armement (Direction Des Poudres), Paris, France

Filed Apr. 7, 1969, Ser. No. 814,076
Claims priority, application France, Apr. 10, 1968, 147595
Int. Cl. F42c *19/12*
U.S. Cl. 102—70R **7 Claims**

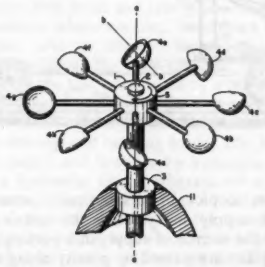


An igniter suitable for use with solid propellant rockets comprises a substantially cylindrical body formed of a flexible plastic material having an axial bore and axially extending cylindrical cavities symmetrically distributed around the axial bore with the axes of the cavities lying on at least one ring centered on the bore axis. Radial passages connect the cavities with the axial bore and with the outside of the body. A primary charge, preferably of black powder contained in a latticework casing, and means for assembling the primary charge are located in the axial bore, and an ignition charge comprising alumino-thermic pellets are symmetrically located in the cavities.

3,581,663
CONTROL APPARATUS

Arthur M. Lohmann, Hopkins, Mich., assignor to Honeywell Inc., Minneapolis, Mich.

Filed Oct. 17, 1968, Ser. No. 768,301
Int. Cl. F42c *15/28*
U.S. Cl. 102—81.2 **3 Claims**



An omnidirectional turbine providing a rotational output of one sense in response to fluid flow approaching the turbine from any direction. The invention is contemplated for use with air-arming munition fuzes.

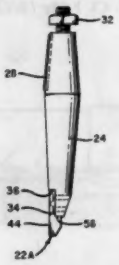
3,581,664
TAMPER FOOT MOUNTING ARRANGEMENT

William A. Kruse, 949 Reliez Station Road, Lafayette, Calif., and Jan Max Crowell, 1514 Folger Drive, Belmont, Calif.

Filed Dec. 23, 1968, Ser. No. 786,094
Int. Cl. E01b *27/14;* **E01c** *19/32*
U.S. Cl. 104—10 **2 Claims**

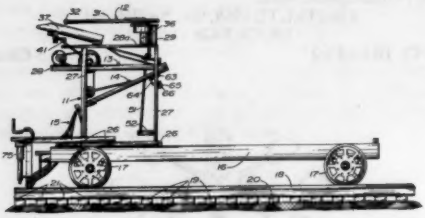
A combination tamper foot and shank for use in a tamping machine for tamping ballast of a railroad bed or the like, comprising an elongated shank with means at one end for removably attaching the same to a tamping machine of conventional construction. A generally vertical flat transversely extending mounting surface is formed adjacent the lower end of the shank, and a tamping foot is removably secured to said

surface. The foot is formed with opposite forward and rear faces and is of increased thickness adjacent the lower edge to provide increased strength and wear material thereat. The foot is secured to the shank with the mounting surface of the shank abutting the rear face of the foot. A plurality of spaced



through holes are formed in the mounting surface of the shank for removably attaching the foot to the shank by machine screws which extend through the foot and threadedly engage the tapped holes in the shank. The screws may be cemented to the shank to prevent inadvertent loosening thereof during use of the tamper.

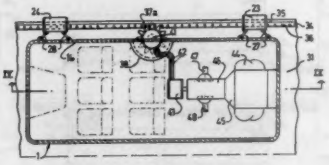
3,581,665
RAILWAY SPIKE ALIGNER
Frank W. Johnson, 603 Rich Ave. East, Spokane, Wash.
Filed Feb. 27, 1969, Ser. No. 802,960
Int. Cl. E01b *29/26*
U.S. Cl. 104—17 **7 Claims**



A mechanism to pick up magnetically permeable spikes from a random supply and position the spikes at a vertical distance below the source of supply in a particularly oriented fashion. The spikes are passed by gravity along a first course that laterally aligns them in vertical position and thence along a second course that orients the head in a predetermined direction to be thereafter delivered for driving or other use. The device is adapted for auxiliary use with existing spike aligning and driving devices.

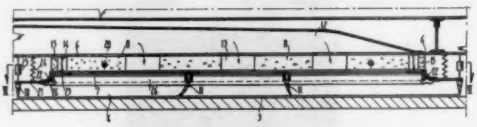
3,581,666
GROUND-EFFECT TRANSPORTATION SYSTEM
Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France
Filed June 12, 1969, Ser. No. 832,749
Claims priority, application France, Sept. 27, 1968, 167910
Int. Cl. B61b *13/08;* **F16h** *1/04;* **B61c** *11/04*
U.S. Cl. 104—23FS **4 Claims**

A transportation system comprising a prepared track, a ground-effect machine movable therealong with the interposition of at least one pressure-fluid cushion, and means for propelling the machine, said means comprising at least two toothed members—namely one gearwheel and one member reacting with the gearwheel teeth—borne the one by the machine and the other by the track and drive means for rotating the gearwheel, the toothed members having tooth systems which mesh with one another, at least one of the



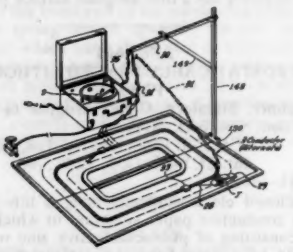
tooth systems being at least partly formed by a rubberlike resilient material.

3,581,667
SUSPENSION SYSTEMS FOR GROUND-EFFECT MACHINES
Jean Henri Bertin, Neuilly-Sur-Seine, France, assignor to Bertin & Cie, Plaisir, France
Filed July 22, 1968, Ser. No. 746,671
Claims priority, application France, Aug. 3, 1967, 116,767
Int. Cl. B61b *13/08;* **B60v** *3/04*
U.S. Cl. 104—23FS **13 Claims**



A suspension system, for a ground-effect machine having a payload structure and a ground-effect plenum chamber with a top thereto, said suspension system comprising a resilient padlike formation located in the space between said structure and said top and portions of said formation having each a predetermined resistance to forces acting thereon, the respective resistances of at least two of said portions being different from one another.

3,581,668
REMOTE CONTROL EQUIPMENT APPLICABLE TO TOY RACING CARS
Luis Ingels, 1642 Second St., Duarte, Calif.
Filed May 15, 1968, Ser. No. 729,357
Int. Cl. A63h *33/26*
U.S. Cl. 104—149 **4 Claims**



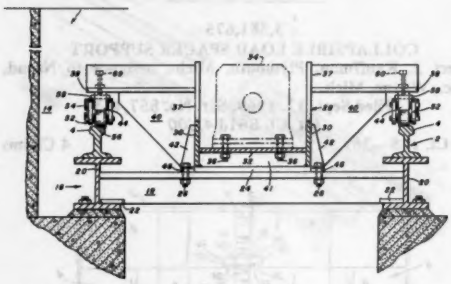
A remote control system applicable to the driving and steering mechanism of miniature racing cars, or the like, comprising two direct current motors M2 and M3 (FIG. 5) located within the car, one of said motors positively connected to the drive shaft of the car and the other positively connected to its steering mechanism; and a remote control unit (FIGS. 6, 7 and 8) free from mechanical connection to

the car, said control unit comprising a steering control wheel 9 having means associated therewith whereby the turning of said control wheel in one direction will cause the motor M3 operatively connected to the steering mechanism in the car to turn its steering wheels to the right and the turning of said control wheel in the opposite direction will cause said steering mechanism to turn the car's steering wheels to the left.

3,581,669
SUPPORT APPARATUS FOR THE ACTUATING CYLINDER OF A RAIL-MOUNTED CAR

Eino E. Seppala, Waukegan, Ill., assignor to United States Steel Corporation

Filed June 26, 1969, Ser. No. 836,835
Int. Cl. B61b *13/12*
U.S. Cl. 104—162 **3 Claims**

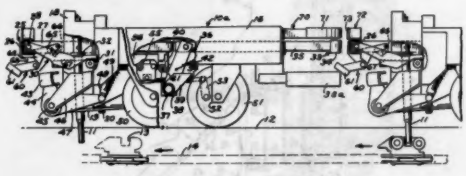


Disclosed is apparatus for supporting, in horizontal position, an actuating cylinder for a rail-mounted car. The apparatus of the invention includes a stationary support surface beneath the rails on which the car is mounted. A cylinder cradle having two spaced pairs of laterally extending brackets overlying the rails is detachably affixed to the support surface. A pivotally mounted wheel housing containing a wheel rotatable therein is disposed on each of the brackets with the wheel in the housing in engagement with one of the rails. A screwjack is provided threaded through each of the brackets and in pressure contact with the wheel housing attached to each bracket. Pressure may be applied to the wheel housing by turning the screwjack to lift the cylinder cradle from the support surface so that the cradle and the cylinder may be moved along the rails to a point where the cylinder can be conveniently removed from the cradle and a replacement substituted therefor.

3,581,670
ACCUMULATING AND PUSHER TOW TRUCK CONVEYOR SYSTEM

Allen R. Larivee, Mt. Clemens, Mich., assignor to American Chain & Cable Company, Inc., New York, N.Y.

Filed May 13, 1968, Ser. No. 728,639
Int. Cl. B65g *17/42, 17/38*
U.S. Cl. 104—172 **8 Claims**

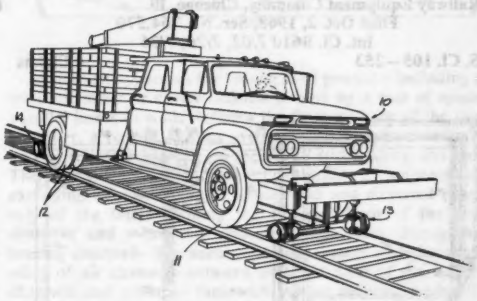


A tow truck conveyor system comprising a plurality of tow trucks, each of which has a tow pin extending downwardly through a slot in a floor to engage a conveyor. Each tow truck has a movable front bumper that is operatively connected to the tow pin to raise the tow pin out of engagement with the conveyor upon encountering an obstacle or a preceding tow truck. Each tow truck further includes a rear bumper that is adapted to be held in its rearward position when the front bumper is moved rearwardly to cause the rear bumper to engage the front bumper of a succeeding tow truck. Each tow truck further includes a fixed rearwardly extending centrally located projection and a forwardly extending centrally located projection which are adapted to engage one another. The centrally located front projection is on the front accumulation bumper so that when the tow pin of a preceding carrier is in down position but not in engagement with the conveyor, the front bumper of a succeeding carrier will engage the rearward projection of the preceeding carrier to cause the tow pin of the succeeding carrier to be moved out of engagement with the conveyor.

3,581,671
HYDRAULICALLY ACTUATED FLANGED GUIDE WHEELS OF A CONVERTIBLE RAIL-HIGHWAY VEHICLE

James D. Hart, 6526 Fordham Drive, Tucson, Ariz.

Filed Jan. 23, 1969, Ser. No. 793,324
Int. Cl. B61d *15/00;* **B61f** *900;* **B62d** *61/12*
U.S. Cl. 105—215 **11 Claims**



A pneumatically tired convertible rail-highway vehicle provided with retractable front and rear guide wheel assemblies. The front assembly, when lowered, is adapted to engage the rails of a track and to lift the front pneumatic wheels therefrom, the rear assembly when lowered, being adapted to engage the rails of the track and to carry a portion of the rear load, the remaining portion being carried by the rear pneumatic highway wheels which remain in contact with the rails to provide the driving and braking force. The front and rear assemblies are raised and lowered by hydraulic actuators associated with a hydraulic circuit wherein oil at substantially constant pressure is supplied to the actuators by a pressurized accumulator tank. Pressure in the tank is maintained by a hydraulic pump which is controlled by a pressure sensitive switch and operates to deliver oil to the accumulator only when the pressure therein falls below a predetermined level.

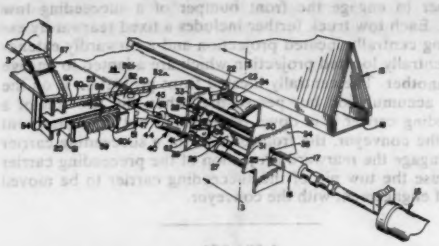
3,581,672
HOPPER CLOSURE ACTUATING AND LATCHING MECHANISM

Herman A. Aquino, Hobart, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 27, 1968, Ser. No. 787,415
Int. Cl. B01d *7/04, 7/18;* **B61d** *7/28*
U.S. Cl. 105—240 **10 Claims**

In a railroad hopper car, discharge door operating means including pneumatic drive means, longitudinally extending slide linkage, opposed transversely extending arm structures pivotally connected to the slide linkage and to respective door locking bar means, biasing means resisting locking of each bar means to the door to allow the pivoted doors to close before the respective arm structures are placed in the door closed and locked position, and counterbalancing spring means resisting fast gravity opening of the horizontal doors of the empty hopper but allowing the doors to open gradually

and assisting door closing, said pneumatic drive means placing the arm structures in an over center door locking position



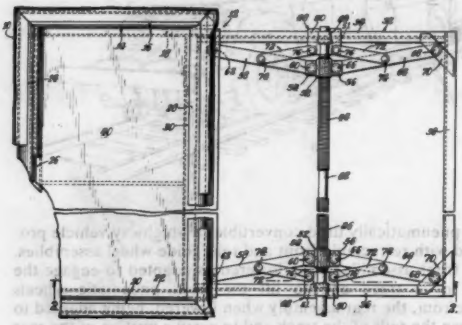
and being double acting for moving the arm structures back past the over center position.

3,581,673

SCREW OPERATED LINKAGE MECHANISM FOR SLIDE GATE

Worrell M. Danielson, Clawson, Mich., assignor to Enterprise Railway Equipment Company, Chicago, Ill.

Filed Oct. 2, 1968, Ser. No. 764,570
Int. Cl. B61d *7/02, 7/20, 7/26*
U.S. Cl. 105—253 **4 Claims**



Operating mechanism for a gate slidable between closed and open positions relative to the discharge opening of a hopper outlet assembly. The operating mechanism includes a rotatable threaded operating shaft extending transversely of the path of movement of the gate, thrust bearing means threaded on the operating shaft, and linkage means connected between the thrust bearing means, hopper outlet assembly, and the gate, whereby the gate is moved toward the operating shaft as the latter is rotated in one direction and away from the operating shaft upon rotation of the latter in the other direction.

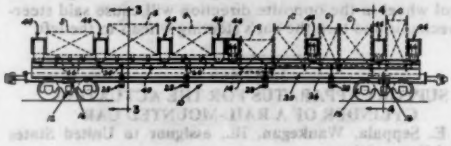
3,581,674

RAILWAY FLATCAR

Walter E. O'Leary, Creve Coeur, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 16, 1969, Ser. No. 816,602
Int. Cl. B60p *7/00;* **B61d** *45/00*
U.S. Cl. 105—367 **5 Claims**

A railway flatcar for selectively transporting generally cylindrical articles, such as steel coils, or articles having a generally rectangular cross section, such as stacks of flat steel plates or plywood sheets. Load dividers are positioned between the separate articles and separate load support members are arranged between the load dividers for supporting articles having a generally rectangular cross section. The load dividers and separate load support members are movable along the length of the railway car for positioning at selected intervals along the length of the car and the load supports are mounted in such a manner as to be movable under the load dividers for positioning on either side of an adjacent load divider, as well as to be stored beneath a load



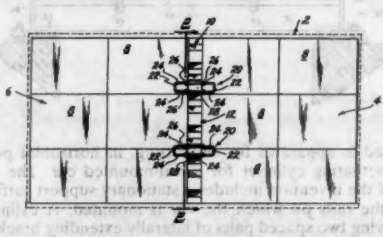
divider such as desired when cylindrical steel coils and the like are being transported. The floor of the car slopes downwardly from the side sills to the center sill to form a pocket for the steel coils.

3,581,675

COLLAPSIBLE LOAD SPACER SUPPORT

Robert J. Kauffman, Plymouth, Mich., assignor to Narad, Inc., Wayne, Mich.

Filed Sept. 12, 1969, Ser. No. 857,483
Int. Cl. B61d *45/00*
U.S. Cl. 105—369 **4 Claims**



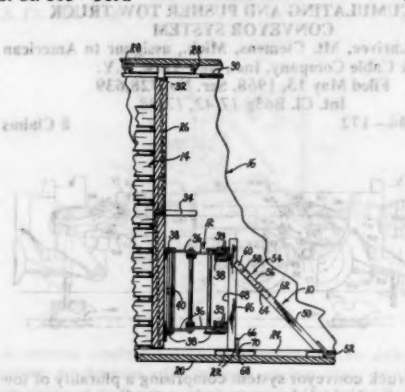
A support formed of wire bent to define an elongated loop having overlapping and relatively slidable side portions releasably secured together and adapted to be assembled in embracing relation to the cell walls of an expandable honeycomb load spacer to suspend the same between a load of articles and an adjacent surface.

3,581,676

PREFABRICATED BRACE FOR LOADING BOXCARS

John D. Torosian, 4568 E. Michigan, Fresno, Calif.

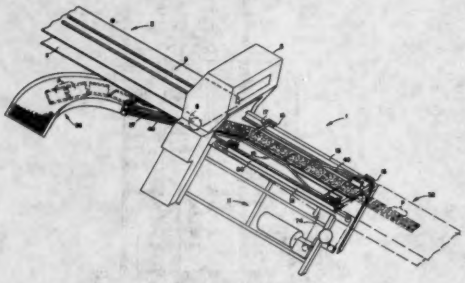
Filed Sept. 26, 1968, Ser. No. 762,918
Int. Cl. B61d *45/00*
U.S. Cl. 105—369S **1 Claim**



A prefabricated brace suited for use as a support in the loading of cargo stowed for transport in a cargo receiver of the type including a supporting floor having openings formed

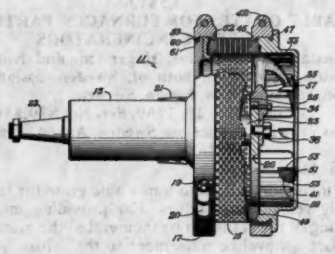
therein, characterized by a downwardly extended protrusion adapted to be received in a selected opening and having a horizontally aligned lip disposed at the lowermost end of the protrusion for engaging a horizontal surface adjacent to the selected opening, whereby the brace may be caused to be supported in both vertical and horizontal directions at selected positions along the floor of the receiver.

3,581,677
MACHINE FOR LOADING BAKING PANS
Leonard R. Strong, Eugene, Oreg., assignor to Davidson Baking Co., Portland, Oreg.
Filed Feb. 19, 1969, Ser. No. 806,341
Int. Cl. A21b 3/00
U.S. Cl. 107—7 6 Claims



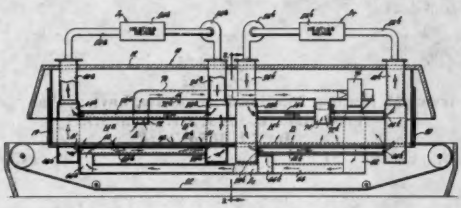
The present disclosure is of a machine operable in conjunction with other bakery conveyor arrangements to accomplish the deposit of pastry articles to be baked into consecutively presented baking pans. A pan conveyor assembly is shown mountable within a framework and is operable to receive bakery pans and continuously move them along past the discharge point of associated bakery conveyor arrangements to receive the discharged pastry articles. A second conveyor assembly is interchangeable with the pan conveyor assembly to permit both panned and unpanned bakery products to be handled along one production line. The pan conveyor assembly includes a belt powered in a manner allowing for precise speed settings for synchronization of pan delivery to receive the pastry articles. The belt as shown travels closely beneath the discharge point of the associated conveyor arrangement.

3,581,678
PELLET MILL WITH BEARING AND WEAR TRANSLATIVE ELEMENT
Charles R. Landers, 5155 Winifred Drive, Fort Worth, Tex.
Filed Mar. 12, 1969, Ser. No. 806,351
Int. Cl. A21c 11/16
U.S. Cl. 107—14 10 Claims



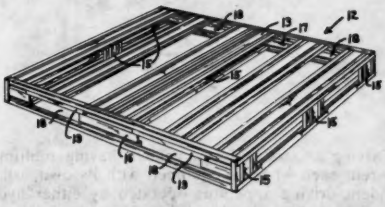
This specification discloses an improvement in a pellet mill having a cylindrical feed receiver clamped to a radially perforated and cylindrical rotatable die. Rollers are disposed interior of the die for extruding feed through the perforated die into pellet form, the die being connected with a supporting cartridge by a ring clamp. The cartridge has an annular groove extending peripherally around a flanged portion, and an intermediate element is inserted in the groove to form a bearing and wear translative surface that engages the clamp.

3,581,679
OVEN APPARATUS
Peter Jansen, and Wolfhard Erling, both of Villingen, Black Forest, Germany, assignors to Fr. Winkler Kg, Spezialfabrik Fur Backereimaschinen und Backofen
Filed Dec. 2, 1968, Ser. No. 780,372
Int. Cl. A21b 1/24
U.S. Cl. 107—63 8 Claims



In an oven apparatus for baking food products including an oven chamber or cavity defined in part by a pair of spaced parallel liners or walls defining the floor and top of the oven chamber, a pair of heating systems providing both radiative and conductive heating of the air in the heating channels. The first heating system includes a plurality of longitudinally extending heating channels adjacent to and disposed exteriorly of the liners forming the top and floor of the oven chamber and means for circulating hot gases through the heating channels. The second heating system includes a plurality of air channels between adjacent ones of the heating channels and coplanar therewith, means defining a plurality of orifices whereby air is circulated through the heating channels and through the oven chamber or cavity. Preferably, the channels are formed by corrugated or meandering members made of a heat conductive material so that the cross section of the heating channels is trapezoidal with its larger base confronting the oven cavity, the slanting sides of the corrugated member providing a common wall dividing the heating channels and the air channels. This arrangement provides an oven which, while compact, nevertheless provides both radiative and conductive heat of the air in the oven cavity as well as convection flow through it.

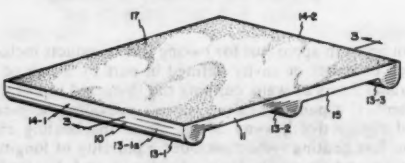
3,581,680
MULTICHANNELED MEMBER AND STRUCTURES FORMED THEREWITH
Elton A. Fleming, Minninger, and Robert R. Kruse, Shawnee County, both of, Kans., assignors to F-K Engineering, Inc., Topeka, Kans.
Filed Jan. 16, 1970, Ser. No. 3,430
Int. Cl. B65d 19/18
U.S. Cl. 108—58 6 Claims



A multichanneled member adapted to assemble with like multichanneled members in normal relation and in longitu-

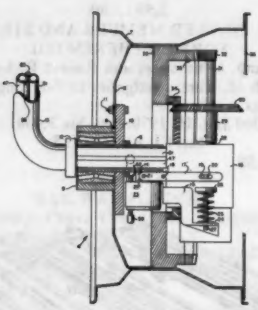
dinal relation to form structures, such as load bearing pallets, containers, and the like. The multichanneled member has laterally spaced parallel and offset wall portions connected by laterally extending wall portions to form a plurality of side-by-side channels opening in opposite directions and an edge wall at each edge of the multichanneled member to form edge channels in cooperation with said wall portions. Each of the channels is sized to receive one edge wall therein or one end of a like multichanneled member therein whereby the multichanneled members are extending in the same direction or in a normal relation respectively. A structure formed of a plurality of the multichanneled members has vertically spaced apart top and bottom decks formed of a plurality of laterally spaced multichanneled members and a plurality of support members extending vertically therebetween to form a load bearing pallet having side members extending normal to the multichanneled members of the top and bottom decks.

3,581,681
PALLET
Irving M. Newton, 265 Hawthorne Drive, Layton, Utah
Filed Mar. 10, 1969, Ser. No. 805,739
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **9 Claims**



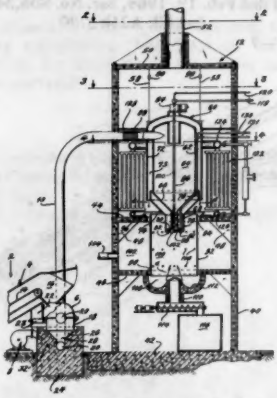
A pallet is constructed of a thin-walled, resinous shell filled with a foam core bonded to the inside surface of the shell. The shell includes integral support beams spaced appropriately to accommodate a forklift for warehousing operations. Materials of construction are selected to meet strength requirements at minimum cost.

3,581,682
DRIVING APPARATUS FOR A WHEELED VEHICLE
Edward S. Kontranowski, Bay City, Mich., assignor to Aerospace America, Inc., Bay City, Mich.
Filed Feb. 24, 1969, Ser. No. 801,254
Int. Cl. B60k *7/00*
U.S. Cl. 180—55 **14 Claims**



Driving apparatus for a vehicle having multiple wheels wherein each wheel is equipped with its own, wholly independent driving apparatus operated by either hydraulic or electrical means. The driving mechanism provides power for either driving or braking its associated wheel and it is operable to drive its wheel at a selected one of a number of different speeds or, alternatively, to permit the wheel to rotate freely.

3,581,683
REFUSE DISPOSAL APPARATUS AND PROCESS
Martin Collier, Jr., 1117 Alexander Drive, Festus, Mo.
Filed Mar. 16, 1970, Ser. No. 19,835
Int. Cl. F23g *5/00*
U.S. Cl. 110—8-R **18 Claims**

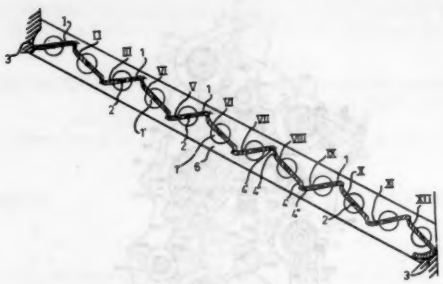


A refuse disposal apparatus includes a shell having a hopper assembly suspended therein. The hopper assembly comprises an inner wall defining a collection chamber and a jacket surrounding the inner wall. An airstream with refuse entrained in it discharges into the collection chamber where the refuse is dropped and allowed to collect. The air is exhausted from the chamber and enters an air channel between the jacket and inner wall. The air leaving the channel forms an air curtain within the shell, and beyond the air curtain the air passes downwardly along side a sleeve which encircles a combustion chamber. Below the combustion chamber the air at the outside of the sleeve impinges against a diverting surface which directs it inwardly and then upwardly into the center of the combustion chamber. A feed device at the base of the refuse collecting chamber feeds refuse into the upwardly directed draft at a controlled rate, thereby mixing the refuse and air and enabling the refuse to be burned in the combustion chamber. The gaseous products of combustion are diverted through the air curtain to remove particulates therefrom, while the solid residue is collected in a chute opening out of the diverting surface.

3,581,684
MOVABLE GRATES FOR FURNACES, PARTICULARLY REFUSE INCINERATORS
Nils Gustav Axel Nobelius, Hagersten, and Kurt Soren Albertsson, Stockholm, both of, Sweden, assignors to Sven Arvid Alexandersson, Farsta, Sweden
Filed Mar. 26, 1969, Ser. No. 810,550
Claims priority, application Sweden, Apr. 4, 1968, 4489/68
Int. Cl. F23b *1/18*
U.S. Cl. 110—39 **9 Claims**

The invention relates to a movable grate for furnaces, particularly refuse incinerators. For providing movement and spreading of the refuse to be incinerated the grate is arranged to impart a wavelike movement to the refuse. According to the invention, the grate is composed of steps which are relatively movable in opposite directions and each of which is pivoted about a central axis extending through the respective step, said step being equipped with a drive including reciprocating means which impart a rotary motion to the grate steps about the axes so that adjacent grate steps will

move in opposite directions. Within a group of grate steps thus caused to move alternately in opposite directions, a



synchronizing mechanism is arranged between the axes of a pair of adjacent steps.

3,581,685

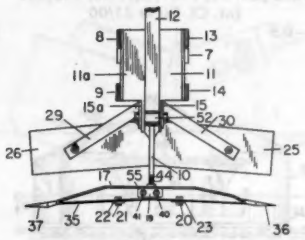
DEVICE FOR DISTRIBUTING CHEMICALS BENEATH THE SOIL SURFACE AND CONDITIONING SEED BEDS

Billy R. Taylor, 210 Willowood, Levelland, Tex.

Filed Apr. 1, 1968, Ser. No. 717,685

Int. Cl. A01c *23/02*; **A01b** *13/08*

U.S. Cl. 111—7 **3 Claims**



This invention relates to a device which distributes a layer of chemicals within the soil, with minimum disturbance of the soil surface.

3,581,686

METHOD FOR CONTROLLING NEMATODES

Richard L. Raymond, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 714,169, Mar. 15, 1968. This application Oct. 29, 1968, Ser. No. 771,620

Int. Cl. A01n *7/04, 9/00, 21/00*

U.S. Cl. 111—1 **7 Claims**

This invention relates to the use of hydrocarbon compounds as hatching agents for nematodes, and their subsequent use in conjunction with nematocides, when applied either directly or in pelletized form, for the extermination of nematodes.

3,581,687

BOBBIN WINDING DEVICE FOR SEWING MACHINES

Gunter Meier, Weingarten, and Willi Meier, Karlsruhe-Durlach, both of, Germany, assignors to G. M. Pfaff A. G., Kaiserslautern/Pfalz, Germany

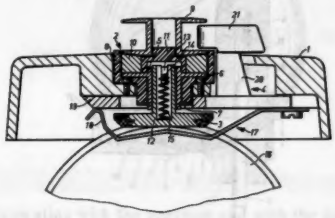
Filed Feb. 7, 1969, Ser. No. 797,391

Claims priority, application Germany, Feb. 8, 1968, P30863

Int. Cl. B65h *54/18*

U.S. Cl. 112—218 **5 Claims**

A bobbin winding device for sewing machines comprises a bobbin holder having a shaft journaled in a wall of the sewing machine housing and a driven friction wheel having a shaft mounted telescope-fashion in said first shaft and urged into driving engagement with a continuously rotating driving wheel by a spring operably interposed between said shafts. A flat control spring is disposed at right angle to said shafts and has an intermediate portion urging the driven wheel to a position of disengagement from the driving wheel. A slide operable by a control member between a rest position and an



operative position and camming with said control spring enables the latter to be disengaged from the driving wheel, to cause engagement of the driving wheel with the driven wheel for the starting of a bobbin winding operation. The control member acts as a stop entering the outer space between the flanges of a bobbin being wound, to initiate the automatic stoppage of the winding operation upon the outer thread winding turns engaging said stop.

3,581,688

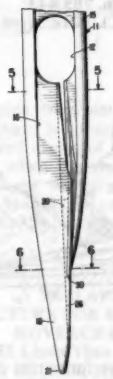
SELF-THREADING NEEDLES

Stanley J. Ketterer, Morris Plains, N.J., assignor to The Singer Company, New York, N.Y.

Filed May 4, 1970, Ser. No. 034,162

Int. Cl. D05b *85/02*

U.S. Cl. 112—224 **4 Claims**



A sewing machine needle with the pointed extremity formed with a slot extending upwardly into the bottom of the needle eye to define a minor point at one side of and above the main needle point. The slot is nonplanar in transverse configuration and provides a concave recess into the side of the main needle point into which recess the minor point is bent.

3,581,689

SEWING MACHINE CONSTRUCTION

Felix J. Berube, 153 River Street, Sanford, Maine

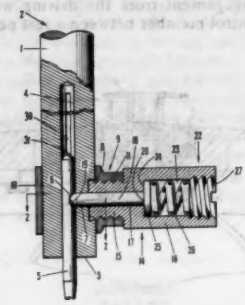
Filed Dec. 20, 1968, Ser. No. 785,657

Int. Cl. D05b *55/02*

U.S. Cl. 112—226 **8 Claims**

A sewing machine having a mechanism for operatively disengaging a needle from a needlebar when the needle hits an impenetrable object. The needle is provided with a transverse slot which normally engages the end of a movable pin which

pin holds the needle in fixed relation to the needlebar. An adjustable spring in turn tensions the pin to a preselected position whereby excessive forces on the needle occasioned



by hitting an impenetrable object overcomes the force exerted by the spring on the pin thereby allowing operative disengagement of the needle from the needlebar.

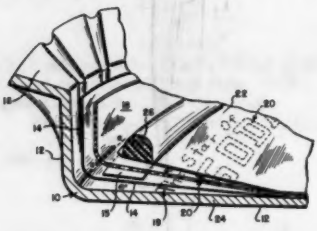
ERRATUM

For Class 112—252 see:
Patent No. 3,581,716

3,581,690
CROWN TYPE CLOSURE WITH DOUBLE REMOVABLE LINER UNIT ENCLOSING TRAPPED INDICIA AND METHOD OF MANUFACTURE

G. Claudio Zapata, Mexico City, Mexico, assignor to Zapata Industries Inc., Frackville, Pa.

Continuation-in-part of application Ser. No. 731,852, May 24, 1968, now abandoned. This application Dec. 16, 1968, Ser. No. 785,443
Int. Cl. B21d *51/46*
U.S. Cl. 113—80 **6 Claims**



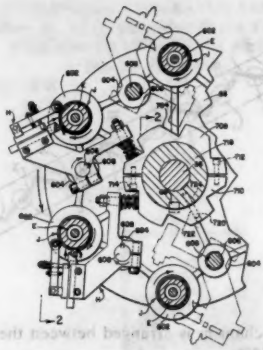
The closure cap or crown for bottles disclosed, comprises a crown shell having a print covered by a size coat, a removable liner unit including a first removable liner coating in the shell over the size coating carrying printed indicia, such as a question, and being either transparent or opaque, a second liner coating of transparent plastic material covering the first liner coating and the printed indicia thereon, and an annular sealing ring at the periphery of the second liner coating.

3,581,691
APPARATUS AND METHOD FOR TRIMMING CAN BODIES

John S. Ringler, Hastings, Mich., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Apr. 17, 1969, Ser. No. 817,050
Int. Cl. B21d *51/00*
U.S. Cl. 113—120 **11 Claims**

Cylindrical can bodies having irregular ends are circumferentially trimmed by a knife moving into engagement with a rotating can body. The knife is arranged to form a burr on the outside edge of the cut and the burr is swaged flat by a roller or flat tool following the knife. The knife and swaging means are on a common support movable toward and away

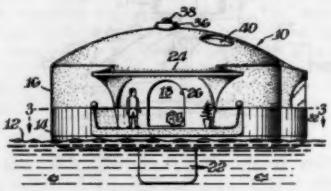


from rotating can bodies. The swaging means may be independently spring biased toward a can body.

3,581,692
AMPHIBIOUS STRUCTURE

Domenico Mortellito, 716 W. Matson Run Parkway, Brandywine Hills, Wilmington, Del.

Filed Jan. 31, 1969, Ser. No. 795,607
Int. Cl. B63b *35/00*
U.S. Cl. 114—0.5 **10 Claims**



A pair of shell-like structures, each integrally cast from a polymeric material, form upper and lower members which together define a hollow enclosure or cavity. The lower member is formed of a polymeric material having a higher density than that of the upper member to provide stability and structural strength for the structure.

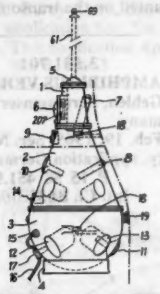
3,581,693
RELEASABLE BUOY FOR SUBMARINES

James Basset, Prouais par Broue, Eure-&-Loir, France

Filed Mar. 24, 1969, Ser. No. 809,912
Claims priority, application France, Mar. 22, 1968, Sept. 2, 1968, Nov. 15, 1968, 144,939;164,824;175,272
Int. Cl. B63g *8/24*; **B63b** *21/52*
U.S. Cl. 114—16.5 **14 Claims**

My invention has for its object a buoy adapted to be released by a wrecked submarine so as to define its location at sea, the release and operation of said buoy being obtained automatically in the case of a grounding at a considerable depth or else at the end of a predetermined period during which the crew has ceased being active or else purposely by the crew. To this end, the buoy anchored to the submarine is provided with a circuit producing its release with reference to the submarine by cutting out its moorings, said circuit being closed either purposely by control means located in the submarine or else automatically through the pressure prevailing at a depth which is normally forbidden to submarines or again under the action of a delayed means which is to be

reset periodically by the crew so as to act on the releasing circuit only when the crew is no longer fit for resetting said



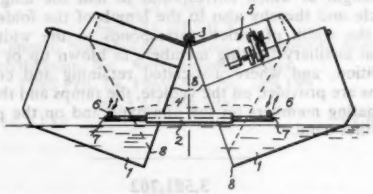
means. The buoy includes furthermore signalling means wherethrough its position may be ascertained.

3,581,694

LONGITUDINALLY SPLIT BARGES WHICH ARE INTERCONNECTED BY MEANS OF HINGES

Kjell Werenskiold, Bekkestua near Oslo, Norway, assignor to Ingenior F. Selmer A/S, Oslo, Norway

Filed Mar. 5, 1969, Ser. No. 804,501
Int. Cl. B63b *35/30*
U.S. Cl. 114—29 **2 Claims**



The present invention relates to an improvement in longitudinally split dump barges where the two barge halves are interconnected by hinges so that by means of one or more pressure cylinders, the two halves may be pivoted away from and towards each other. The pressure cylinder comprises two double acting pistons with opposingly directed piston rods which at their free ends are hinged at an suitable distance below the interconnecting hinges of the barge. When the barge is opened, only the strong cylinder shell is exposed in the gap opening between the barge halves, the piston rods with the finely polished surfaces being protected inside the two barge halves.

3,581,695

BUOYANT ELEMENTS FOR APPARATUS FOR RAISING SUBMERGED VESSELS

Lewis A. Hayden, Denver; Jim D. Helbig, Brighton, and Hugh G. Shepherd, Jr., Denver, all of, Colo., assignors to Jim D. Helbig, Brighton and Cyclo Manufacturing Company, Denver, Colo., part interest to each

Filed Apr. 1, 1969, Ser. No. 811,882
Int. Cl. B63c *7/04*
U.S. Cl. 114—52 **5 Claims**

Buoyant elements for apparatus for raising submerged vessels comprise hollow apertured spheres of light weight material impervious to air and water provided with means which hinder or prevent the entrance of water into the elements when external pressure exceeds the internal pressure in the spheres conveyed from a pressure equalizing chamber into the sunken vessel, and facilitate passage of water out of the elements when internal pressure exceeds external pressure. The constructions include hollow spheres each provided with an aperture; one modification including a weighted area surrounding the aperture, another including a weighted tube communicating with the aperture and with the interior of the sphere, and another including a long tube

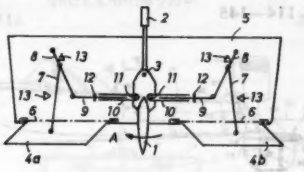
communicating with the aperture and with the interior of the sphere for free passage of air and difficult passage of water through the tube.

3,581,696

HEELING COMPENSATING TRIM PLATE ARRANGEMENT FOR MOTOR BOATS

Bengt Erland Ilon, 43 Stromkarlsvagen, Bromma, Sweden

Filed Feb. 26, 1969, Ser. No. 802,383
Claims priority, application Sweden, Mar. 4, 1968, 2774/68
Int. Cl. B63b *1/22*
U.S. Cl. 114—66.5 **3 Claims**



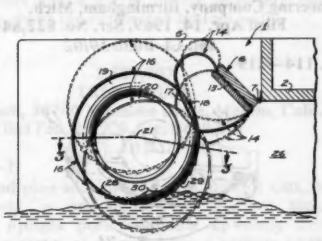
A heeling preventing trim plate arrangement for motor boats in which a linkage is connected between the steering means of the boat and a pair of trim plates. The parts are constructed so that when the steering means is moved in either direction from its neutral position, the proper trim plate is moved in a manner to counteract the heeling tendency of the boat which is produced by the movement of the steering means.

3,581,697

SEAL STRUCTURE FOR RIGID SIDEWALL HOVERCRAFT

Fred C. Gunther, 3455 Linda Vista Road, Glendale, Calif.

Filed Feb. 13, 1969, Ser. No. 798,954
Int. Cl. B63b *1/38*
U.S. Cl. 114—67 **9 Claims**



A seal structure for a hovercraft having spaced rigid sidewalls joined by a deck in which conjoined minor and major inflatable cylinders extend between the sidewalls of the

hovercraft, the minor cylinder being transversely distortable and hinged as well as sealed to the stern or bow margins of the deck and the ends of the cylinders being in substantially sealing and sliding engagement with the sidewalls; the underside of the major cylinder being intended for water contact and having ribs arranged to permit controlled escape of air to minimize frictional contact.

3,581,698
SAIL BATTEN

John U. Bete, 2 Main Street, Marion, Mass.

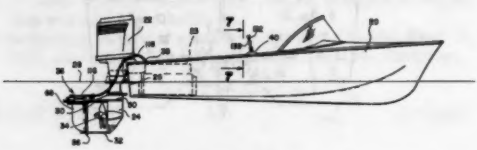
Filed June 5, 1968, Ser. No. 734,703
Int. Cl. B63h 9/06; B32b 17/04, 27/38
U.S. Cl. 114—102 4 Claims

A tough, thin, flexible batten made of layers of strips of material embedded in and bonded together by plastic. The outer layers of the strip may be successively shorter to taper the batten and make it more flexible at one end than the other.

3,581,699
PROPELLER THROTTLING DEVICE FOR BOATS

Charles A. Pedersen, 16230 21st St. N., Phoenix, Ariz.

Filed Apr. 16, 1969, Ser. No. 816,590
Int. Cl. B63h 25/44
U.S. Cl. 114—145 1 Claim

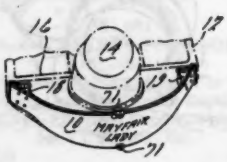


A propeller throttling device for boats, wherein a pair of pivoted vanes are disposed rearwardly of a propeller in the water, such that the vanes may be in a position to follow the propeller and may be parallel therewith or at substantially right angles thereto, so that a powerful propeller may be throttled in a manner to permit trolling operation of a boat at low speed; said vanes being pivoted by novel rectilinearly operated cross head and linkage structure controlled remotely by flexible shaft and lever mechanism located in the hull of a boat; said propeller throttling device being particularly adapted for use in connection with powerful outboard motors.

3,581,700
STERN BOARD

Harold A. Storch, Birmingham, Mich., assignor to Mayfair Engineering Company, Birmingham, Mich.

Filed Apr. 14, 1969, Ser. No. 822,844
Int. Cl. B63b 59/02
U.S. Cl. 114—219 13 Claims



There is herein disclosed an accessory for an outboard motorboat comprising a generally flat sheetlike board having hinges symmetrically positioned at its opposite ends connecting it abaft a boat transom for upward pivotal movement, the board being bent to an arcuate configuration so as to bow away from the transom between its ends and protectively enclose a motor mounted on the transom.

3,581,701
AMPHIBIOUS VEHICLE

Hermann Walter Gehlen, Permasenser Strasse 60, Kaiserslautern, Pfalz, Germany

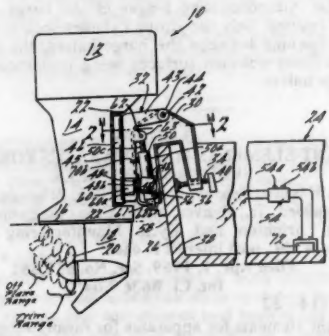
Filed Feb. 19, 1969, Ser. No. 800,416
Claims priority, application Germany, Feb. 27, 1968, P 15 56 451.9
Int. Cl. B63f 3/00
U.S. Cl. 115—1 5 Claims

Amphibious vehicle adapted for use as a ferry or a bridge unit with a vehicle body in the form of a floating unit having auxiliary floating members at its longitudinal sides which can be blown up and swung outwardly, and ramps linked to both ends of the body that have a pivot joint centrally with respect to the length thereof, where the ramps are also in the form of buoyant hollow bodies and which, when unfolded, are of a length corresponding to the length of the vehicle and when folded are shortened to one-half the length, and are equipped with coupling means at the end surfaces thus established, where furthermore loose planks are arranged on the vehicle the length of which corresponds to half the length of the vehicle and thereby also to the length of the folded ramps, and the width of which corresponds to the width of the lateral auxiliary floating members in blown up or unfolded condition, and where associated retaining and connecting means are provided on the vehicle, the ramps and the auxiliary floating members on the one hand and on the planks on the other hand.

3,581,702
TRIM AND TILT MECHANISM FOR OUTBOARD PROPULSION UNIT

Theodore J. Moberg, Hartford, Wis., assignor to Chrysler Corporation, Highland Park, Mich.

Filed July 28, 1969, Ser. No. 845,363
Int. Cl. B63h 5/12
U.S. Cl. 115—41 16 Claims

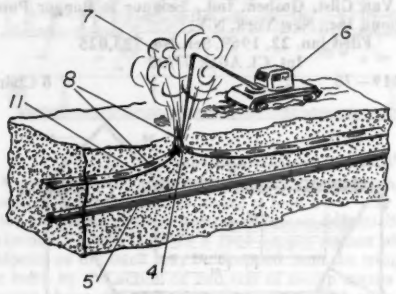


A trim and tilt mechanism for an outboard motor comprising a short stroke hydraulic cylinder acting against the outboard motor at a relatively long moment arm to accomplish trimming of the motor against the resistance of the propeller thrust, and a long stroke hydraulic cylinder acting at a relatively short moment arm to accomplish rapid upward tilting movement of the unit to its fully raised position.

3,581,703
WARNING TAPE FOR UNDERGROUND INSTALLATIONS

Robert C. Hosack, 12459 Barry Knoll, Houston, Tex.

Continuation-in-part of application Ser. No. 616,524, Feb. 16, 1967, now abandoned. This application Apr. 28, 1969, Ser. No. 819,663
Int. Cl. G08b *3/00*
U.S. Cl. 116—67 10 Claims

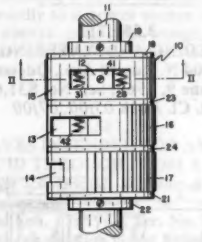


A warning tape, to signal the presence of underground installations, which includes capsules containing a smoke-releasing or otherwise attention-compelling chemical substance, released when the tape is raptured.

3,581,704
SIGNAL DEVICE

Richard Connell, Northborough, Mass., assignor to Machinery Electrification, Inc., Northborough, Mass.

Filed Feb. 14, 1969, Ser. No. 799,199
Int. Cl. G09f *9/00*
U.S. Cl. 116—133 5 Claims



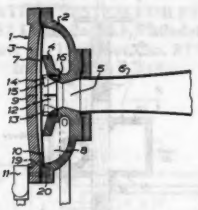
The present invention relates to a signal device and, more particularly, to apparatus for use in retroreflective pattern coding for use in a conveyor system or the like.

3,581,705
DIAPHRAGM VALVE SOUND TRANSMITTERS OPERATING ON GASEOUS PRESSURE MEDIUM

Bengt L. Holm, Malmo, Sweden, assignor to Kockums Mekaniska Verkstads Aktiebolag, Malmo, Sweden

Filed Jan. 8, 1970, Ser. No. 1,430
Claims priority, application Sweden, Jan. 9, 1969, 223/69
Int. Cl. G10k *9/00*
U.S. Cl. 116—142 5 Claims

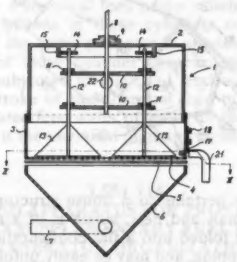
In a diaphragm valve sound transmitter operating on gaseous pressure driving medium and having a diaphragm which, when no signal is to be generated, is blocked against a seat at the inlet end of a horn outlet passage under the action of the pressure of the driving medium in a back pressure chamber located behind the diaphragm, undue stresses in the diaphragm due to the pressure in the back pressure chamber are avoided by a support member in the horn outlet passage. The support member surface facing the diaphragm is spaced from the diaphragm a distance greater than the deflection of the diaphragm towards the support member during oscillation but smaller than the maximum diaphragm deflection permissible in view of the stresses.



3,581,706
APPARATUS FOR UNIFORMLY DISTRIBUTING A DISINTEGRATED FIBROUS MATERIAL ON A FIBRE LAYER FORMING SURFACE

Torben Borup Rasmussen, Tousvej, Denmark, assignor to Karl Kristian Kobs Kroyer, Aarhus-Vibg, Denmark

Filed Nov. 13, 1969, Ser. No. 775,479
Claims priority, application Denmark, Nov. 15, 1967, 5702
Int. Cl. B05b *7/14*
U.S. Cl. 118—312 3 Claims



An apparatus for uniformly distributing a disintegrated material on a fiber layer forming surface comprising a cylindrical housing having a perforated plane-surfaced bottom wall, an inlet opening for a stream of air containing suspended fibers and a stirrer having impellers rotating a short distance above the perforated bottom wall.

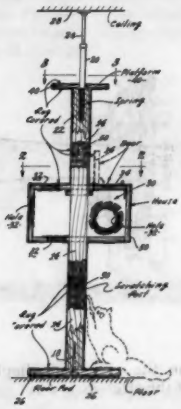
3,581,707
TREE HOUSE

Weldon R. Cook, 30700 Manzono Drive, Malibu, Calif.

Filed Feb. 9, 1970, Ser. No. 9,480
Int. Cl. A01k *29/00*
U.S. Cl. 119—1 3 Claims

An improved play and housing structure for cats, or other household pets, is provided. The structure includes a pedestal, an upright post extending upwardly from said pedestal, a compartment mounted about halfway up the post, and a spring-loaded mounting bracket at the top of the post for engaging the ceiling of the room in which the structure is located. The mounting bracket serves to maintain the structure firmly and rigidly between the floor and ceiling of the room, with the post in an upright position. The entire struc-

ture may be covered, for example, with carpeting to provide a scratching post for the cat, and also for the comfort of the



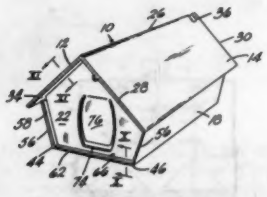
pet. A platform may be mounted at the upper end of the post to serve as a perch.

3,581,708

FOLDING ANIMAL HOUSE

James W. Beck, 601 Milnes Road, and William B. Beck, 333 Signal Road, both of Newport Beach, Calif.

Filed Feb. 28, 1969, Ser. No. 803,341
Int. Cl. A01k *01/02*
U.S. Cl. 119—19 **6 Claims**

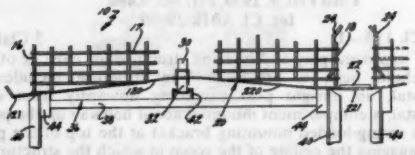


The invention pertains to a house structure, particularly suitable for animals and pets, which is of a relatively small size and may be folded into a flat configuration for storage, handling and shipping, and may be easily unfolded into a usable shelter configuration. The house may be constructed of inexpensive materials, such as paperboard or the like, and includes structural features which strengthen the house when unfolded to a usable configuration, and lock the house in the unfolded condition.

3,581,709

CONFINEMENT CAGES FOR TURKEYS

Robert L. Van Huis, Route #2; Willis R. Voran, 1701 104th Street, and Edwin W. Faber, 225 Park Street, all of Zeeland, Mich.

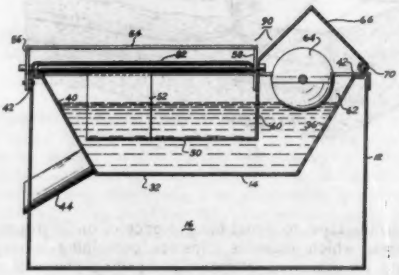
Filed Sept. 12, 1968, Ser. No. 759,430
Int. Cl. A01k *31/00*
U.S. Cl. 119—24 **5 Claims**

A confinement cage construction having a mesh floor, with a roost member extending lengthwise of the cage and disposed centrally of and positioned atop such floor. A second member disposed beneath the floor is oriented in vertical alignment with the roost member and is secured to the same through the mesh floor, with the floor interposed therebetween. Support standards engage the lower such member to provide at least part of the vertical support for the cage enclosure.

3,581,710

SANITARY HOG WATERING TROUGH

Carl W. Van Gilst, Goshen, Ind., assignor to Bangor Punta Operations, Inc., New York, N.Y.

Filed Jan. 22, 1969, Ser. No. 793,025
Int. Cl. A01k *07/00*
U.S. Cl. 119—78 **8 Claims**



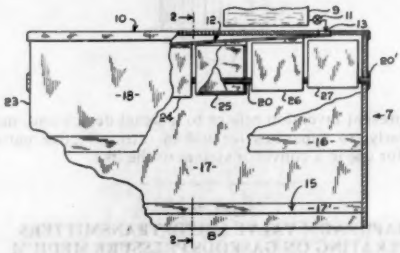
A watering trough for hogs having a water pan with a perforated false bottom positioned above the principal bottom of the water pan through which dirt and other foreign matter pass and settle onto the principal bottom. The perforated bottom is connected to a cover for the pan and a cover for an automatic water valve which form a unitary structure pivotally connected to the rear side of the water pan to permit the false bottom and covers to be raised as a unit to permit access to the water pan for cleaning and servicing.

3,581,711

AUTOMATIC FEEDING AND WATERING APPARATUS

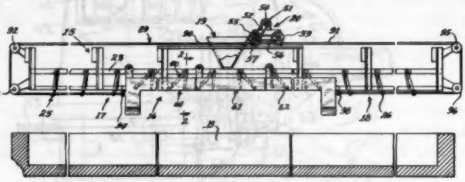
Marcus L. Bates, 6904 N. Russell Ave., Odessa, Tex.

Filed June 9, 1969, Ser. No. 831,600
Int. Cl. A01k *05/00, 07/00*
U.S. Cl. 119—51.5 **6 Claims**



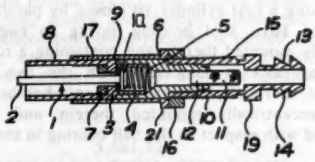
An automatic feeding and watering apparatus having a main housing within which there is disposed a plurality of pivotally mounted upwardly opening spaced apart enclosures, with each enclosure including a food containing chamber and a water containing chamber therein. Overlying the chambers there is disposed a water conveying means comprised of individual sloped troughs, each arranged in series relationship so as to intercept and convey water from a first enclosure to a last enclosure, whereupon the water fills the water chamber thereof causing the last enclosure to rotatably invert, thereby depositing the water and food contained therein into a food receptacle or feeding trough. Each of the enclosure means is sequentially inverted in a similar manner.

3,581,712
SWEEP SHUTTLE FEEDER
Robert G. Ferris, Harvard, Ill., assignor to Starline, Inc.
Filed Mar. 9, 1970, Ser. No. 17,492
Int. Cl. A01k *05/02, 05/00;* B65g *47/34, 25/10*
U.S. Cl. 119—56 8 Claims



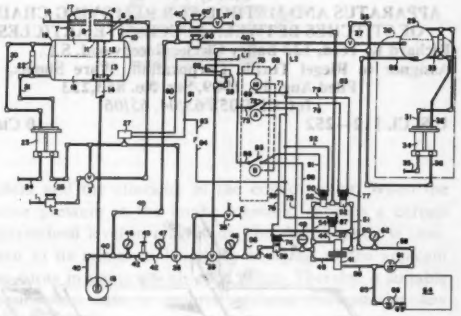
A sweep shuttle animal feeder of the type having a feed trough which reciprocates above a feed bunk that is about twice the length of the trough so that feed deposited into the reciprocating trough from a feed supply station above the midpoint of the bunk may be dropped from the trough along the bunk by the action of two sets of sweep means that are pivoted above the path of travel of the trough with a set on each side of the feed supply station for selectively controlling relative movement between the deposited feed and the trough. The sweep means of the set through which the leading end of the trough is passing at any given time pass over feed in the trough while the sweep means of the set through which the trailing end of the trough is passing at any given time arrest feed in the trough so that it drops off the trailing end. The trough is made up of a plurality of longitudinal sections so articulated to compensate for straightness irregularities in the tracks supporting the trough, with each section being pivotally connected to the adjacent section at the bottom of the trough and also interconnected at the top of the trough for relative longitudinal movement with each section being provided with a pair of trolleys spaced from the joint between trough sections for supporting the same on the track. The motive means for reciprocating the trough along the feed bunk includes a cable extending from each end of the trough outwardly to a power source in a manner that the power source always pulls the trough, regardless of the direction of movement, to eliminate compressive forces on the trough.

3,581,713
FEEDING VALVES INTENDED FOR ANIMALS TO DRAW LIQUID THROUGH FROM A SUPPLY
Gordon Knighton Crooks, 15 Wheeler Ave., Eastwood, Nottinghamshire, England
Filed Feb. 17, 1969, Ser. No. 799,730
Claims priority, application Great Britain, Nov. 19, 1968, 54736/68
Int. Cl. A01k *07/00*
U.S. Cl. 119—72.5 4 Claims



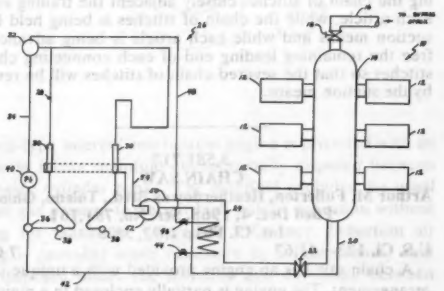
An animal feeding valve through which an animal (e.g. in a cage) can draw liquid from a supply to which the valve is connected, comprises a valve head disposed at the supply side of a valve seat and biassed against the seat by a spring at said supply side, a valve stem on the valve head extending through the seat, and an outlet cylinder surrounding the stem, the end of the valve stem being exposed at the end of the cylinder so that when an animal applies its mouth to the latter it can move the end of the stem sideways to open the valve; the extent of the sideways movement is regulated by an annular member which is mounted within the cylinder for axial adjustment therealong and through which the stem extends.

3,581,714
CHEMICAL TREATING SYSTEM FOR STEAM BOILERS
Frank J. Smith, 7352 Limekiln Pike, Philadelphia, Pa.
Filed Nov. 17, 1969, Ser. No. 877,207
Int. Cl. F22b *37/48*
U.S. Cl. 122—1 14 Claims



For chemical treatment of water in steam boilers, a separate chamber is provided for makeup water in a deaerating heater; and return condensate and makeup water are fed into the boiler in accordance with their relative water pressures at a junction, chemical feed solution is fed to the boiler strictly in proportion to the feed of makeup water without regard to the feed of return condensate. This is preferably accomplished by a chemical feed pump which has two coaxial cylinders and pistons in these cylinders connected to opposite ends of the same piston rod, providing four cylinder spaces. Two of these cylinder spaces acting in the same direction are subjected to regulated feed water pressure for the pressure stroke of the chemical feed pump, one is subjected to regulated feed water pressure for the suction stroke, and the fourth is the chemical pumping chamber.

3,581,715
METHOD AND APPARATUS FOR PROVIDING COKE-OVEN GAS AS SUPPLEMENTARY FUEL FOR A STEAM GENERATOR ORGANIZATION
Joseph G. Singer, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Nov. 21, 1969, Ser. No. 878,666
Int. Cl. F22b *1/18*
U.S. Cl. 122—5 6 Claims



A method and apparatus for providing coke oven gas a supplementary fuel for a steam generator organization. The off-gas from an arrangement of coking stokers is collected in

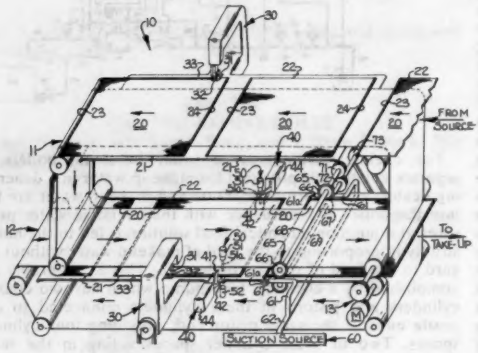
a manifold which is in communication with a steam generator organization of the fluid recirculating type. The gases are transported from the manifold to the steam generator, under the influence of a conventional gas-conveying induced draft fan located therebetween, to provide a supplementary fuel for the steam generator. Between the induced draft fan and the manifold is located a heat exchanger for the purpose of passing the coke oven gases in heat exchange relationship with a portion of the main boiler circulating fluid to substantially reduce the temperature of the gases to facilitate their handling by the fan and externally insulated ducting means.

3,581,716

APPARATUS AND METHOD FOR REMOVING CHAINS OF STITCHES BETWEEN SUCCESSIVE ARTICLES

Richard K. Teed, 123 Bailey Circle, Greenwood, S.C.
Assignor to Riegel Textile Corporation, Ware Shoals, S.C.

Filed Aug. 26, 1969, Ser. No. 853,223
Int. Cl. D05b *65/04, 65/06*
U.S. Cl. 112—252 **10 Claims**



An apparatus and method for severing and removing chains of stitches formed between successive articles being stitched and advanced along a predetermined longitudinal path of travel including the following components and steps. A first cutting mechanism is actuated by a sensing means sensing the leading edge of each successive article to sever the chain of stitches closely adjacent the leading edge of each article. A suction means is mounted in a position subsequent to the first cutting mechanism for drawing therein and holding the free trailing end of the chain of stitches after cutting thereof by the first cutting mechanism. A second cutting mechanism is mounted adjacent the suction means for severing the chain of stitches closely adjacent the trailing edge of each article, while the chain of stitches is being held by the suction means and while each article is being advanced, to free the remaining leading end of each connecting chain of stitches so that the severed chain of stitches will be removed by the suction means.

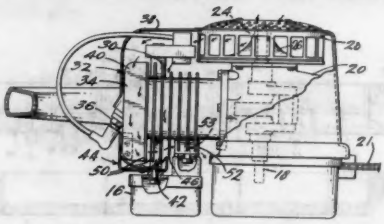
3,581,717

CHAIN SAW

Arthur M. Fullerton, Heatherdowns Blvd., Toledo, Ohio

Filed Dec. 4, 1968, Ser. No. 781,161
Int. Cl. F01p *1/02, 5/06*
U.S. Cl. 123—41.67 **7 Claims**

A chain saw has an engine provided with a unique cooling arrangement. The engine is partially enclosed in a main housing of the chain saw and has a blower on one side thereof which is effective to direct air around substantial portions of the engine cylinder for cooling purposes. In accordance with the invention, a baffle is mounted on the cylinder to direct air along the side of the cylinder opposite the blower. This side of the cylinder further is provided with channels to



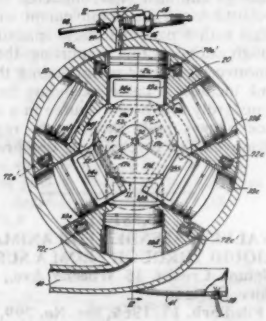
facilitate movement of the air therealong, in a direction transverse to cooling vanes of the cylinder.

3,581,718

ROTARY INTERNAL COMBUSTION ENGINES

David V. Petty, 11125 Osage Avenue, Inglewood, Calif.

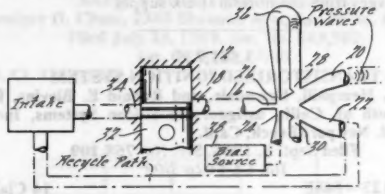
Filed Nov. 14, 1968, Ser. No. 775,831
Int. Cl. F02b *57/00*
U.S. Cl. 123—44 **8 Claims**



A rotary internal combustion engine including: a housing comprising a first cylinder **10** closed by parallel end plates, **101** and **101***a*, said housing having an engine block **20** rotatably mounted therein and containing a rotor **11** whose rotational axis is coincident with the axis of said first cylinder, said end plates each having a ball bearing (**19** and **19***a*) eccentrically mounted therein and symmetrically disposed with respect to the ball bearing in the opposite end plate:

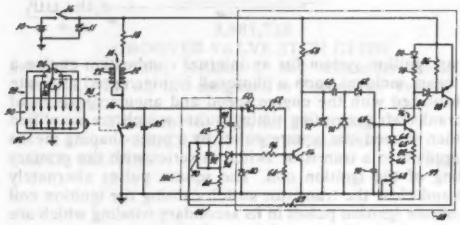
a plurality of piston cylinders angularly spaced from each other around said axis within said engine block; a plurality of pistons each slidably mounted in a different one of said piston cylinders and operatively connected to said rotor, said first cylinder having a fuel intake port **41** a and an exhaust outlet **42** angularly spaced therearound, the eccentricity of said ball bearings with respect to the axis of the rotor determining the throw of the pistons; said rotor having a shaft extending from both ends thereof for transmitting power therefrom.

3,581,719
FLUIDIC EXHAUST RECIRCULATOR FOR TWO STROKE CYCLE ENGINES
Leonard P. Gau, Birmingham, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Oct. 30, 1969, Ser. No. 872,596
Int. Cl. F02b *33/04*; **F02m** *25/06*
U.S. Cl. 123—73 **10 Claims**



A fluidic element connected to the exhaust of a two cycle engine for recirculating fuel-rich exhaust portions to the combustion chamber.

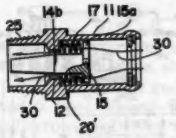
3,581,720
ELECTRONIC ENGINE R.P.M. LIMITING DEVICE
Lewis W. Hemphill, and Ronald E. Blevins, both of Balboa, Calif., assignors to Silicon Systems, Incorporated, Newport Beach, Calif.
Filed Nov. 22, 1968, Ser. No. 778,173
Int. Cl. F02p *9/00*; **F02d** *11/08*
U.S. Cl. 123—118 **22 Claims**



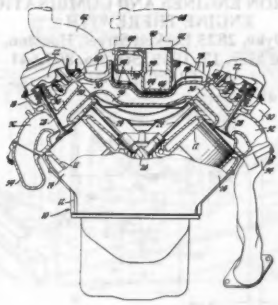
In the ignition system of an internal combustion engine a switching means is connected in series with the primary winding of an ignition coil. The switching means opens and closes to interrupt current flow through the primary winding generating ignition pulses in the secondary winding of the ignition coil at a frequency determined by the speed of the engine. A sensing means is responsively coupled to the switching means and generates an output signal when the engine reaches a predetermined r.p.m. A silicon-controlled rectifier connected in parallel with the switching means is gated on by the output signal of the sensing means to short out the switching means and thereby disable the ignition system. The silicon-controlled rectifier is turned off by the sensing means when the engine speed returns to an r.p.m. below the predetermined r.p.m. to allow the ignition system to function in a normal manner.

3,581,721
CRANKCASE VENTILATION VALVE
Hideo Horiuchi, Yokohama, Japan, assignor to Nissan Jidosha Kabushiki Kaish, Yokohama, Japan
Filed May 20, 1969, Ser. No. 826,218
Claims priority, application Japan, June 13, 1968, 43-40,217
Int. Cl. F02f *9/00*
U.S. Cl. 123—119 **2 Claims**

A crankcase ventilation valve for an internal combustion engine having an engine crankcase ventilation system wherein a conduit communicates between the intake and the engine crankcase. The ventilation valve comprises a cylindrical housing having a lateral partition wall, an orifice bored through the partition wall, a rod having a tapered portion axially movable through the orifice and a spring seat secured to the opposite end of the rod, and a coiled spring inserted between the partition wall of the housing and the spring seat of the rod. The rod moves relative to the orifice in response to the balance between the negative pressure at the intake manifold and the elasticity of the coiled spring. When the negative pressure at the intake manifold exceeds a certain predetermined level in magnitude, the coiled spring is compressed to its minimum length by bringing all the adjacent spring turns in contact with each other. Thereby, a suitable minimum flow rate is ensured without necessitating any metallic stopper.



3,581,722
INTERNAL COMBUSTION ENGINE WITH INDUCTION AIR HEATING MEANS
Malcolm R. McKellar, Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 3, 1969, Ser. No. 873,473
Int. Cl. F02m *35/04, 31/04, 31/14*
U.S. Cl. 123—122 **7 Claims**



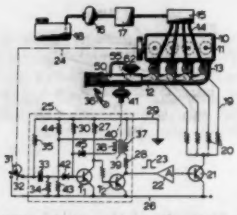
A vee-type internal combustion engine is provided with an aluminum intake manifold conventionally disposed between the engine cylinder banks. The manifold excludes the usual exhaust gas passage to permit high output operation without heating for maximum volumetric efficiency. Induction air heating is provided when necessary by a first exhaust heat stove disposed under the manifold and extending between the banks and a second exhaust heat stove conventionally mounted on one of the exhaust manifolds. Both heat stoves include means for delivering heated air to the engine air cleaner for delivery to the engine carburetor and inlet manifold.

3,581,723

FUEL INJECTION ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES WITH ACCELERATING ENRICHMENT

Hermann Scholl, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 18, 1969, Ser. No. 834,302
Claims priority, application Germany, June 27, 1968, P 17 51 605.1
Int. Cl. F02m *63/00*
U.S. Cl. 123—140MP **10 Claims**



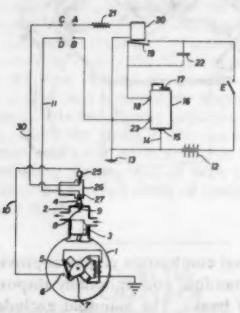
A fuel injection arrangement for enriching the air-fuel mixture during acceleration of the engine. The duration of a pulse applied to the electromagnetically actuated injection valve of the engine, is varied as a function of the pressure prevailing within the intake manifold of the engine. The pulse is supplied by a monostable multivibrator circuit which is actuated synchronously with the rotation of the engine crankshaft. The manifold includes two separate throttles with one throttle positioned by the gas pedal of the engine, and the second throttle positioned through a pressure difference sensing device which measures the difference between the pressure of the intake manifold between the two throttles, and in the intake direction of the manifold. A pressure sensor communicating with the intake manifold between the two throttles varies the inductance of a transformer which operates in conjunction with the monostable multivibrator.

3,581,724

AUXILIARY HIGH VOLTAGE SPARK ATTACHMENT FOR SPARK PLUG-MAGNETO IGNITION INTERNAL COMBUSTION ENGINES AND COMBINATION OF ENGINE THEREWITH

Orien W. Van Dyke, 2825 Lockett Street, Houston, Tex.

Filed Mar. 17, 1969, Ser. No. 807,641
Int. Cl. F02p *3/00*
U.S. Cl. 123—148 **4 Claims**



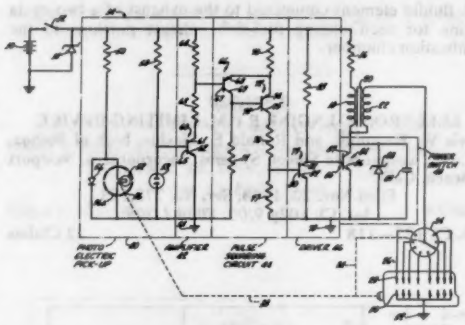
A temporary auxiliary high voltage, high power spark supply attachment for use especially in starting an internal combustion engine which engine has at least one cylinder with a spark plug therein for ignition and a normal spark supply for supplying timed output spark voltage surges, and the combination of such attachment with an engine; in which the attachment comprises a spark supply of a desired high voltage output capability higher than that of the normal spark supply under starting or other conditions and having an output connector adapted to connect to and deliver its high voltage output to the spark plug of such engine, a relay switch connected to said high voltage spark supply for triggering an output voltage surge therefrom when said relay is actuated, and an input connector on said high voltage spark supply for connecting the actuating terminals of said relay switch to the normal spark supply of such engine to be actuated thereby, whereby the high voltage surges from the high voltage supply to the spark plug will be triggered by timed output surges from the normal spark supply.

3,581,725

TRANSISTORIZED IGNITION SYSTEM

Lewis W. Hemphill, Lawndale, and Ronald E. Blevins, Balboa, both of, Calif., assignors to Silicon Systems, Incorporated, Newport Beach, Calif.

Filed Sept. 9, 1968, Ser. No. 758,209
Int. Cl. F02p *3/02*
U.S. Cl. 123—148E **14 Claims**



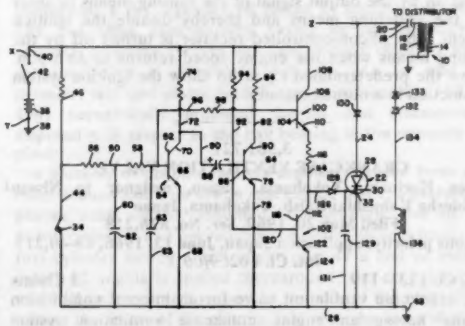
In an ignition system for an internal combustion engine a light beam incident upon a photocell is interrupted at a rate synchronized with the engine speed and angular position of the crankshaft generating timing pulses which are amplified and then shaped into square pulses by a pulse-shaping means and applied to a transistor switch in series with the primary winding of the ignition coil. The square pulses alternately open and close the transistor switch causing the ignition coil to generate ignition pulses in its secondary winding which are applied to the spark plugs of the engine.

3,581,726

CAPACITIVE-DISCHARGE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Alfred Plume, Jr., Taylor, Mich., assignor to Mallory Electric Corporation, Detroit, Mich.

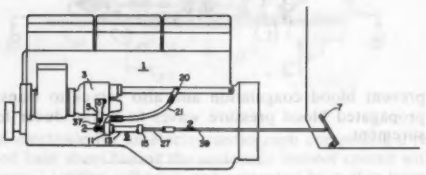
Filed July 22, 1969, Ser. No. 843,489
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 **3 Claims**



The capacitive-discharge system for internal combustion

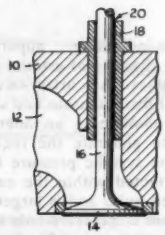
engines comprises a stepup transformer having primary and secondary windings. The capacitor is placed in series with the primary winding. A DC power source including a push-pull full wave oscillator circuit is provided to charge the capacitor. The capacitor is discharged through the primary winding in timed sequence with an operating engine to induce a voltage in the secondary winding sufficient to fire a spark plug.

3,581,727
SAFETY THROTTLE CONTROL
Theodore O. Chase, 2340 Shannon Ave., San Pablo, Calif.
Filed July 23, 1969, Ser. No. 843,982
Int. Cl. F02b *77/00*
U.S. Cl. 123—198 **4 Claims**



A safety throttle control for an internal combustion engine utilizes a liquid pressure expansible link in the fuel control pedal coupling to the engine, and flow couples the lubrication system of the engine to the liquid pressure expansible link, whereby the fuel control pedal becomes functional only when lubrication pressure exists.

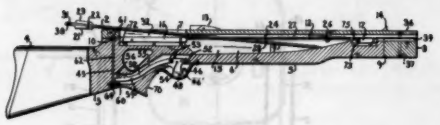
3,581,728
GROOVED VALVE STEM GUIDE
John C. Abraham, Metamora, and Alexander Goloff, E. Peoria, both of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 18, 1970, Ser. No. 12,318
Int. Cl. F01l *3/08;* **F01m** *9/10*
U.S. Cl. 123—188 **3 Claims**



A guide for the stem of an intake or exhaust valve of an internal combustion engine which is provided with two grooves produced by a threading tap with one groove being deeper than the other. The function of the deeper groove is to supply oil to the sliding or bearing surfaces of the stem and guide and the shallower groove serves to retain the oil in the vicinity where it is most needed and thus enable the use of close clearances because of good lubrication.

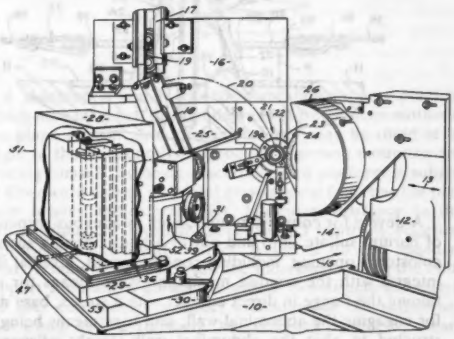
Clearance is provided between an engine valve stem and its guide to insure lubricant supply and to insure reduced wear when the stem is subjected to operating temperatures. Rapid wear occurs in conventional guides if the clearance is either too large or small and, furthermore, if it is too large excessive blowby and carbon buildup occur with excessive oil being lost through the guide.

3,581,729
CROSSBOW STRUCTURE
Leland L. Jones, 1017 S. Willis, Independence, Mo.
Filed June 2, 1969, Ser. No. 829,226
Int. Cl. F41b *5/00*
U.S. Cl. 124—25 **11 Claims**



A crossbow structure for projecting an elongate feathered arrow having a butt portion and an elongate barrel with a bow secured to a forward or muzzle end of the elongate barrel. The barrel has a bore having longitudinally spaced resiliently supported arrow positioning members therein and longitudinal slots at each side of the bore for travel of a bow string therealong. The crossbow structure has a trigger member and linkage operatively connected to a sear for selectively holding and releasing the bow string. A cam safety is positioned to be selectively moved into and out of engagement with the trigger member and an elongate safety pin is positioned to be selectively moved into and out of engagement with the sear for holding or releasing the bow string. The stock has an aperture therein for access to a gripping portion adjacent the trigger member. An upwardly biased arrow positioning member is positioned at both the breech and the muzzle ends of the barrel.

3,581,730
ROTARY CONJUGATE DRESSER
Walter A. Boyd, Jr., Woodstock; Leon J. Barnard, and Hugo A. Lakso, both of Springfield, all of, Vt., assignors to Bryant Chucking Grinder
Filed Jan. 21, 1969, Ser. No. 792,677
Int. Cl. B24b *53/14*
U.S. Cl. 125—11CD **2 Claims**

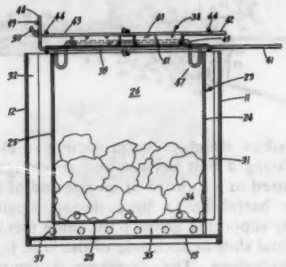


A conjugate wheel dresser for truing a grinding wheel in order to plunge grind surfaces at angles to each other such as the track and rib of the inner race of roller bearings; the mechanism consisting of at least two motor driven dressing cutters, coated with abrasive grits such as diamonds. The dress is accomplished by one pass of the conjugate dresser.

3,581,731
PORTABLE COOKING UNIT
William M. Schulze, 104 South Ninth St., Minneapolis, Minn.
Filed Feb. 11, 1969, Ser. No. 798,397
Int. Cl. A47j *37/00;* **F24b** *3/00*
U.S. Cl. 126—25 **7 Claims**

A flameless combustion method of cooking and portable cooking unit designed to be fueled solely by crumpled paper

sheet, such as newspaper. The unit includes an open top firebox. The walls of the firebox optionally have a limited number of small spaced-apart air vents adjacent the bottom to admit a limited amount of air to the firebox. A broiler rack fits over the top of the firebox to support the food to be cooked. The broiler rack has an essentially nonforaminous



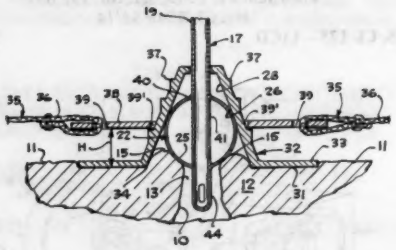
heat-conducting surface covering most of the top open area of the firebox to limit and control combustion of the paper fuel. A food and equipment storage chest is adapted to fit telescopically within the firebox. In one form the unit includes a double walled firebox. In this unit storage space is provided for the broiler rack and for fuel.

3,581,732

STOMA ADAPTER

Gilbert G. Ruiz, Addison, Ill., assignor to Nancy J. Gates, Mt. Prospect, Ill., a part interest

Filed Jan. 14, 1969, Ser. No. 790,946
Int. Cl. A61m *3/00, 25/02*
U.S. Cl. 128—2R **9 Claims**



A device for conveying fluids, such as aqueous suspensions of barium sulfate, into and out of a body opening such as a colostomy opening, including conduit means, a radial flange integral with the conduit means, pressure means for maintaining the flange in direct contact with a stoma, base means for engaging the abdominal wall, said base means being constructed to abut the abdominal wall closely adjacent the stoma, body-encircling means for maintaining the base means in place, said pressure means being fixed with respect to said base means, whereby the body cavity is sealed at the stoma and fluid communication between the cavity and the exterior abdominal wall is prevented.

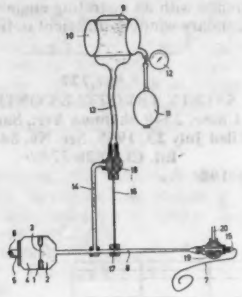
3,581,733

HEART CATHETERIZATION DEVICE

Theo Grandjean, Lausanne, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1968, Ser. No. 783,040
Claims priority, application Germany, Dec. 30, 1967, P 15 66 115.1
Int. Cl. A61b *5/02;* **A61m** *5/14*
U.S. Cl. 128—2.05 **4 Claims**

A device for measuring such things as human blood pressure within the blood vessels and heart, which uses a catheter and adapts same for placement over extended periods during its operation. A salt solution, conveyed by valve controlled conduits, is made to constantly flow through the catheter to



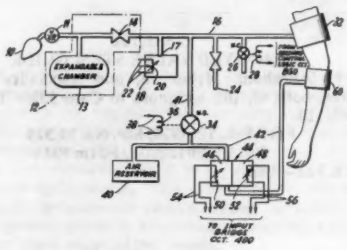
prevent blood coagulation and also serves to transmit the propagated blood pressure waves to a transducer for measurement.

3,581,734

SPHYGMOMANOMETER

Michael Emanuel Croslin, Forest Hills, and John Ronald Keller, Babylon, both of, N.Y., assignors to Phelps Dodge Electronic Products, N.Y., N.Y.

Filed Jan. 31, 1968, Ser. No. 701,943
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05M **11 Claims**



Blood pressure-indicating apparatus automatically produces persisting displays of arterial systolic and diastolic blood pressure values. An artery-occluding cuff, and a sensing cuff located distal thereto and connected in a closed pneumatic system containing an anemometer wire transducer, cooperate to generate the requisite display meter-latching signals. The systolic pressure is indicated only if a second pulse is detected within the expected time interval after a first detected pulse and is larger than the first pulse. The diastolic pressure is indicated only after the systolic pressure has been indicated and only after a pulse is detected which has a peak value less than 0.7 of the largest previous pulse detected.

3,581,735

HEARTBEAT FREQUENCY DETERMINING APPARATUS AND METHOD

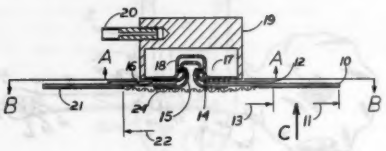
Otto J. Gentner, Boblingen; Karl Grund, Sindelfingen; Miroslav J. Muzik, Herrenberg; Wolfgang E. Ohme; Karoly F. Winkelbauer, Boblingen, and Konrad Hammacher, Dusseldorf, all of, Germany, assignors to Hewlett-Packard G.m.b.H., Boblingen, Germany

Filed June 12, 1968, Ser. No. 736,370
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05T **9 Claims**

Phonocardiographic apparatus particularly useful for measuring fetal heat frequency during prenatal examinations and

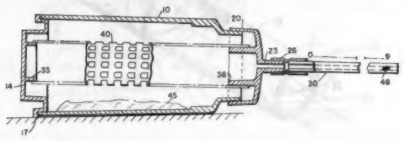
during parturition monitors the rate at which the two heart sounds per heart cycle recur and includes error-detection and correction circuitry that compensates for undetectable rhythmic heart sounds which would otherwise produce erroneous indications of heart frequency.

3,581,736
ELECTROCARDIOGRAPH ELECTRODE
Ilias Zenkich, 5156 N. Monterey Drive, Norridge, Ill.
Filed Dec. 20, 1968, Ser. No. 785,481
Int. Cl. A61b *5/04;* **A61n** *1/04*
U.S. Cl. 128—2.06 **2 Claims**



An electrode for an electrocardiograph comprising a reinforced base sheet having the underside thereof coated with a pressure sensitive adhesive and protected by a thin layer of removable paper. A snap fastener comprising a male and female portion extends through the center of the base sheet with the male portion of the snap fastener being firmly attached to the base sheet. The contacting surfaces of the male and female portion of the snap fastener are provided with a plurality of alternating grooves and ridges to increase the contact area and to prevent relative rotation of the respective male and female portions. A screen or sponge is attached to the underside of the male portion of the fastener and may be the fastener and may be impregnated with an electrically conductive jelly. The female portion of the fastener is mounted into a housing designed for easy gripping with the fingers.

3,581,737
METABOLISM APPARATUS
Morton E. Frank, Deer Park, N.Y., assignor to Sol Lesh, New Hyde Park, N.Y., a part interest
Filed Sept. 9, 1968, Ser. No. 758,407
Int. Cl. A61b *5/00*
U.S. Cl. 128—2.07 **1 Claim**

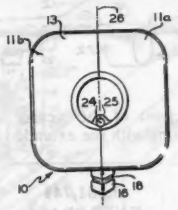


A simple and economical apparatus to demonstrate the metabolism of living things is provided, manufactured of readily mass-produced plastic elements involving basically a concentricity of members wherein such members hold respective entities for measuring metabolism of small creatures.

3,581,738
DISPOSABLE ILLUMINATING ENDOSCOPE AND METHOD OF MANUFACTURE
William C. Moore, Skaneateles, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed Nov. 12, 1968, Ser. No. 774,819
Int. Cl. A61b *1/06;* **B32b** *1/06*
U.S. Cl. 128—6 **6 Claims**

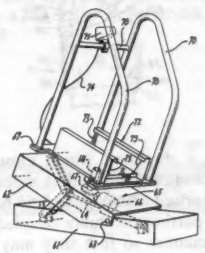
A plastic sigmoidoscope has a generally tubular body with integral shield. Proximally of the shield an extension projects angularly from the body and is adapted to fit into a light source handle. Distally of the shield the body forms a specu-

lum wall having an elongated clad light-conducting member embedded therein. The body is formed in diametrical halves each having a groove in the extension and speculum wall,



continuous from the extension end to a point spaced from the end of the speculum, into which the member has been fitted before permanently securing the halves together.

3,581,739
MOTOR-DRIVEN MUSCLE-BUILDING MACHINE
William E. Brandt, 12567 Saratoga Creek, Saratoga, Calif., and Allen L. Clark, 1654 Sundown Lane, San Jose, Calif.
Continuation-in-part of application Ser. No. 759,637, Sept. 13, 1968, now abandoned. This application Mar. 24, 1969, Ser. No. 818,173
Int. Cl. A63b *23/04*
U.S. Cl. 128—44 **4 Claims**

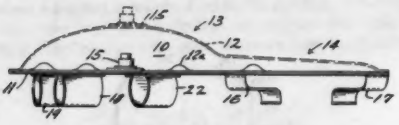


A machine is equipped with a rotating support platform which may have two distinct degrees of freedom or motion in the plane of said platform which latter may be tilted at an angle to the horizontal. The body of a person mounting and bracing himself, or being placed on such platform is subject to downward as well as lateral gravitational forces as the platform rotates and/or translates. Muscular resistance to this pull produces an unusually effective and relatively effortless exercise and therapeutic effect. Angle of tilt and speed of rotation may be varied to suit the individual. When the body support function is combined with a two-directional effect, the user can receive a direct indication of the sufficiency with which he is performing the exercising routine by means of suitably located indicating instruments.

3,581,740
INFLATABLE DEVICE FOR ARTHRITIC THERAPY
Robert D. Sherbourne, Findlay, Ohio, assignor to R. L. Kuss & Co., Inc., Findlay, Ohio
Filed Sept. 2, 1969, Ser. No. 854,530
Int. Cl. A61f *5/10*
U.S. Cl. 128—77 **13 Claims**

An inflatable splint for extending the fingers and wrist of the hand of the wearer. The splint has an inflatable chamber extending over the hand and wrist area of the wearer, with one surface which assumes a planar configuration when the splint is inflated. The one surface has finger loops adapted to receive the fingers of the wearer and positioned such that, upon inflation, the fingers will be moved to a normally ex-

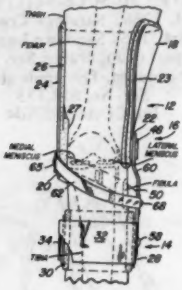
tended, spaced-apart position. Wrist straps on the wrist area are provided to encircle the wearer's wrist so that, upon inflation, the wrist joint of the wearer will be moved to a straight position along with the extended fingers.



3,581,741
KNEE BRACE

Maurice Rosman, 6165 Elmwood Ave., and Anthony Calabrese, 2527 South Warnock St., both of Philadelphia, Pa.

Filed Nov. 4, 1968, Ser. No. 773,069
Int. Cl. A61f *3/00*
U.S. Cl. 128—80 **7 Claims**

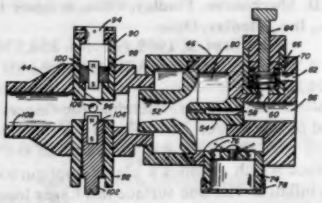


A knee brace is disclosed which closely simulates the rocking-hinge joint motion and sliding motion of a knee. The knee brace is comprised of an upper rigid body portion and a lower rigid body portion pivotably coupled together on the lateral side in a manner so that they may pivot relative to each other about an axis generally perpendicular to the zone of overlap and may slide relative to each other in all radial directions generally parallel to the zone of overlap. In each embodiment, the upper and lower body portions are pivotably connected to a connecting bar. The upper body portion may have an inflatable bladder on its inner surface. The knee brace may be worn under the pants of the wearer who may run, walk, or sit down without giving any indication that he is wearing a knee brace.

3,581,742
INTERMITTENT POSITIVE PRESSURE BREATHING DEVICE

Joseph G. Glenn, Tulsa, Okla., assignor to Medical Services, Incorporated, Tulsa, Okla.

Filed June 11, 1968, Ser. No. 736,173
Int. Cl. A62b *7/00*
U.S. Cl. 128—145.6 **10 Claims**

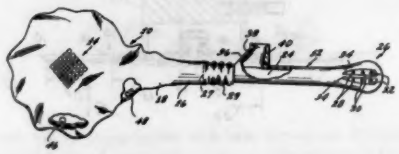


An intermittent positive pressure breathing (IPPB) device permits variable adjustment of maximum flow rates, terminal flow rates, and nebulization for patients having various lung disorders.

3,581,743
DOUCHE

Lenore M. Stein, Inglewood, and Fred R. Brown, Torrance, both of, Calif., assignors to Assignor to said Stein and said Brown, part interest to each

Filed July 3, 1968, Ser. No. 742,286
Int. Cl. A61m *1/00*
U.S. Cl. 128—232 **15 Claims**

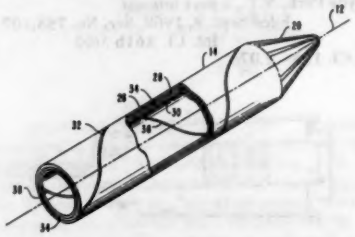


A vaginal douche in which a tubular, liquid discharge tip engages a liquid-impervious, flexible bag. A conduit extends laterally from the tip and defines an opening for conducting liquid into the bag. The bag is of sufficiently flexible material to have no substantial tendency to distend when empty and forms a single-use, unitary structure with the tip.

3,581,744
LAMINATED TUBE STRUCTURE

Joseph A. Voss, Denver, Colo., and Carl W. Johnson, Neenah, Wis., assignors to Joseph A. Voss

Filed May 3, 1968, Ser. No. 726,522
Int. Cl. A61f *15/00*
U.S. Cl. 128—263 **40 Claims**

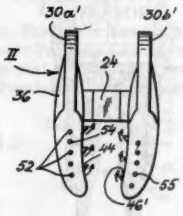


A three-ply, laminated tube structure for use in the fabrication of tampon applicator devices or the like typically comprising an external tube for carrying the tampon and an internal, tampon-ejecting tube slidably received in the external tube. The tube structure is particularly advantageous for use as stock material in the manufacture of external applicator tubes of the type having a folded, tapered forward end which opens by unfolding during ejection of the tampon. The structure includes a glazed tissue inner ply having a relatively high fold endurance, a thin outer ply made of high quality, high strength paper having an extremely smooth coating on the exterior surface, and a relatively thick intermediate ply of short-fibered, porous, blotter-type paper having negligible fold endurance and interposed between and bonded to the inner and outer plies by a brittle, water soluble adhesive. The rear extremity of the external tube is provided with a reenforcing and gripping ring made from relatively heavy tube stock. The internal, tampon-ejecting tube of the applicator device may be formed from three ply tube stock similar to that used for the external tube.

3,581,745
INSTRUMENT FOR REMOVING OBSTRUCTIONS FROM THE THROAT

William C. Eller, 4701 N. Federal Highway C2, Fort Lauderdale, Fla.

Continuation-in-part of application Ser. No. 641,816, May 24, 1967, now Patent No. 3,489,151, dated Jan. 13, 1970. This application Oct. 23, 1968, Ser. No. 769,954
Int. Cl. A61b *17/24, 17/28*
U.S. Cl. 128—356 4 Claims

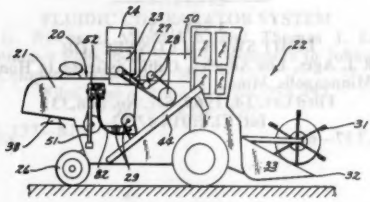


A generally U-shaped instrument for removing obstructing objects from the throat and organs associated therewith has spaced arms which can be squeezed together. The arms are formed with curved hooklike ends having lateral flanges to protect the tongue and parts of the throat when the instrument is inserted in the throat. Wedge-shaped spurs extend laterally from inner sides of the arms to interfit with each other for engaging the obstruction. The spurs can be pivotally mounted.

3,581,746
APPARATUS FOR DISTRIBUTING GRAIN TO A COMBINE CHAFFER SCREEN

Robert A. Louks, Gilman, Iowa

Filed May 1, 1968, Ser. No. 725,871
Int. Cl. A01f *12/24*
U.S. Cl. 130—24 9 Claims



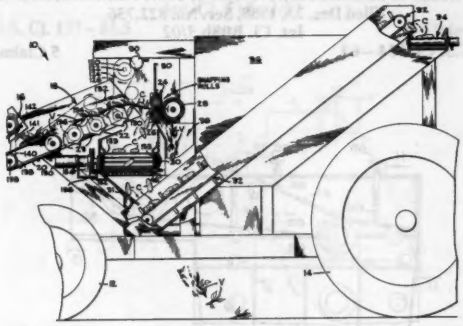
This invention relates to an apparatus for distributing grain to a combine chaffer screen, the apparatus distributing the grain across the width of the screen and including a screw auger extending transversely across the feed end of the screen, the auger being capable of axial rotation in either direction, an independent power means to rotate the auger and a swinging pendulum connected to the power means to effect rotation of the auger in either direction in response to the lateral inclination of the combine.

3,581,747
TAPERED ROLL HARVESTER

Frank F. Scribner, Hoopeston, Ill., assignor to FMC Corporation, San Jose, Calif.

Filed Apr. 29, 1969, Ser. No. 820,219
Int. Cl. A01d *45/00*
U.S. Cl. 130—30 9 Claims

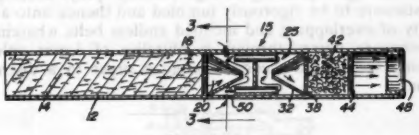
The snapping rolls of a vine crop harvester for cucumbers are tapered from their outer ends to a midportion of the rolls for counteracting the loss of gripping power due to the deflection of the rolls under load.



3,581,748
CIGARETTE FILTER

Joe Cameron, Millbrook, Ala., assignor to International Automated Electronics Corporation

Filed July 2, 1969, Ser. No. 838,589
Int. Cl. A24d *01/04*; A24f *01/08, 01/16*
U.S. Cl. 131—10.5 7 Claims



A tobacco filter including a plurality of metallic foraminous plates for cooling smoke during passage therethrough. A baffle plate is inserted in the smoke stream for causing impinging contact between tobacco smoke and the baffle plate causing the depositing of tar thereon. Conical members are disposed on both sides of the baffle plate to cause acceleration of a smoke stream against the impinging surface of the baffle plate and deceleration of smoke flow on the other side of the baffle plate. Filtration is achieved by small granules of sandstone or gravel. The lip engaging portion of the cigarette filter includes a shredded paper end which is turned inwardly to provide further filtering.

3,581,749
TOBACCO COMPOSITION AND METHOD OF INFLUENCING TOBACCO SMOKE AROMA

Georg Neurath, Hamburg, and Herbert Wichern, Halstenbek, both of, Germany, assignors to H. F. Reemtsma & Ph. F., Parkstr., Germany

Filed July 16, 1969, Ser. No. 842,387
Claims priority, application Germany, July 25, 1968, P 17 92 124.3
Int. Cl. A24b *15/04*
U.S. Cl. 131—17 3 Claims

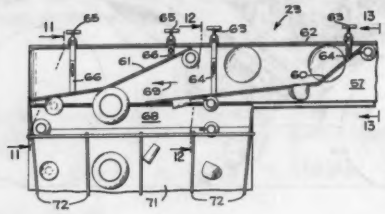
A tobacco product is treated with a flavoring quantity of a biphenyl or cyclohexyl-cyclohexane compound. The specific effective compounds found suitable for the desired purpose are dodecahydrobiphenyl and 1-methyl-3-cyclohexyl-cyclohexane.

3,581,750

AUTOMATIC SCULLERY APPARATUS

Erik I. Naslund, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 628,957, Apr. 6, 1967, Pat. No. 3,483,877.
Filed Dec. 23, 1968, Ser. No. 822,756
Int. Cl. B08b 3/02
U.S. Cl. 134—63 5 Claims



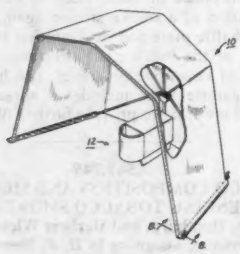
An automatic scullery system and individual components thereof comprising a weight sorter which separates heavy flatware and tableware from light plasticware and debris by using an overflowing tank of water; a flatware sorter that utilizes two perpendicularly arranged and spaced conveyors to separate the flatware from larger tableware items; a debris sorter which utilizes two inclined perpendicular belts, one of which is of a wire mesh and is spaced below the second belt; a size sorter which uses fixed diverters or cams that overlie a conveying surface to divert plasticware items off the conveying surface according to their respective sizes and shapes; and a plasticware washer which comprises a pair of vertically spaced horizontal belts the lower of which carries the plasticware through a plurality of high velocity sprays causing the plasticware to be vigorously tumbled and thence onto a plurality of overlapping and inclined endless belts wherein the plasticware passes through a plurality of lower velocity rinsing sprays and thence through a dryer to a discharge zone.

3,581,751

COLLAPSIBLE AND PORTABLE SHELTER

Bertrand E. Evans, Cassopolis, Mich., assignor to Evans Enterprises, Inc., Mishawaka, Ind.

Filed Feb. 2, 1970, Ser. No. 7,645
Int. Cl. E04f 10/04
U.S. Cl. 135—5R 10 Claims



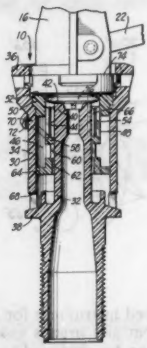
A collapsible and portable shelter having a frame structure of generally inverted L-shaped members with a radially extending portion pivotally connected to a support unit at the lower rear part of the back of the shelter. A cover is attached to the L-shaped frame members and the frame members pivot at the support unit for folding and unfolding the shelter. A fixture is attached to the unit for supporting the shelter in its unfolded position.

3,581,752

METHOD OF CONTROLLING FLOW THROUGH A BALL COCK WITH MINIMUM FLOW NOISE AND IMPROVED FILTERING

Adolf Schoepe, 1620 North Raymond Ave., Fullerton, and Fredric E. Schmuck, 535 Century Drive, Anaheim, Calif.

Filed Mar. 28, 1969, Ser. No. 811,334
Int. Cl. E03d 1/33, 9/14
U.S. Cl. 137—1 3 Claims



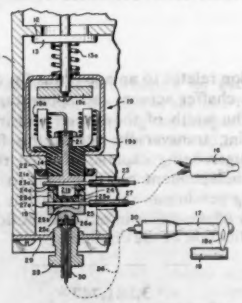
Water flow is directed through a ball cock inlet member centrally into a valve housing, over an annular valve seat controlled by a movable sealing member, and reversely along the inlet member outer side directly into a filtering chamber. From the filtering chamber, all of the water flow is filtered through a series of slots into an outlet chamber, a portion of said flow passing directly through said outlet chamber without further filtering into a refill hose outlet and the remainder thereof being directed circuitously inwardly again along the inlet member outer side and finally outwardly into the interior of a tank mounting said ball cock. All of the ball cock surfaces over which the water flows in passing through the ball cock into the tank interior are formed of sound deadening materials, the major portion thereof being plastic and the remainder a resilient material.

3,581,753

LIMIT SWITCH CONNECTOR

Frederik J. Ages, Los Angeles, Calif., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Oct. 14, 1969, Ser. No. 866,331
Int. Cl. H01h 47/22
U.S. Cl. 137—66 6 Claims



A thermocouple energized safety control having a housing enclosing a safety valve unit, an electrical terminal extending from said unit through a housing wall and terminating in a recess, a closure plate for the recess having a threaded opening therein to receive the terminals of a concentric lead type

of thermocouple, a cup-shaped insulator member surrounding a slotted portion of the terminal, and a transversely slotted, cup-shaped electrical conductor member engageable by the central terminal of the thermocouple leads so that a first wire from a limit switch may be clamped between the valve unit terminal and the insulator member and a second wire from the limit switch may be clamped between the two cup-shaped members, to place the limit switch in series with the safety valve unit and the thermocouple.

3,581,754

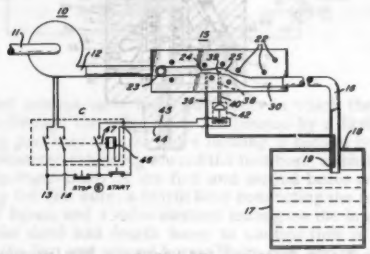
LIQUID LEVEL CONTROL APPARATUS USING FLUIDIC SENSOR

Robert B. Adams, Tredyffrin Township, Chester County, Pa., assignor to Moore Products Co., Spring House, Pa.

Continuation-in-part of application Ser. No. 468,488, June 30, 1965, now abandoned. This application July 3, 1967, Ser. No. 650,839

Int. Cl. F15c *1/10*

U.S. Cl. 137—81.5 **12 Claims**



Liquid level control apparatus in which the liquid is supplied through a fluid supply line without any bypassing of the supplied liquid, a fluid interaction chamber being employed with a pressure takeoff probe being provided in the chamber for controlling the supplying of the liquid and a control fluid connection for sensing the level and controlling the relation of the liquid to the probe.

3,581,755

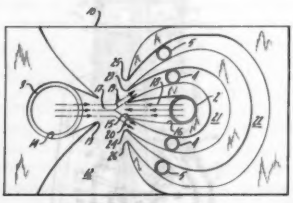
FLUIDIC COMPARATOR SYSTEM

Bjorn G. Bjornsen, Milwaukee, and Thomas J. Lechner, Menomonee Falls, both of, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed June 4, 1968, Ser. No. 734,437

Int. Cl. F15c *1/20*

U.S. Cl. 137—81.5 **6 Claims**



The present disclosure relates to an impacting stream modulator having a pair of opposing nozzles which terminate in aligned and opposed stream forming orifices in a reference chamber. A plurality of output nozzles terminate in output orifices disposed to the opposite sides of the line of the impacting streams. The relative strength of the two supply streams determines the impact point and the direction of the output streams relative to the output nozzles which collect the fluid from the impacting streams and provide an output related to the comparison of the relative strength of the two streams.

3,581,756

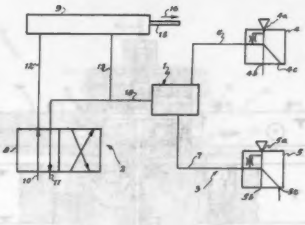
FLUIDIC INTERFACE

Charles R. Pettis, Jr., Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Nov. 21, 1968, Ser. No. 777,622

Int. Cl. F15c *3/02*

U.S. Cl. 137—81.5 **4 Claims**



The fluidic interface includes a spring-loaded, double-headed piston adapted to alternatively open and close at least one back pressure fluidic output in response to the presence of high-pressure power fluid applied at the input of the interface. The interface serves to prevent cross contamination between the power fluid source and the fluidic input.

3,581,757

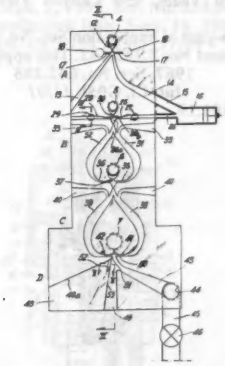
ARRANGEMENT WHICH ALLOWS THE ALTERNATE FORCING BACK AND SUCKING IN OF FLUID

Cyrille Francois Pavlin, Val D'Albian, Jouy-en-Josas, and Edouard Maurice Eugene Aime Mace, Meudon-la-Foret, both of, France, assignors to Bertin & Cie, Plaisin, Yvelines, France

Filed Dec. 19, 1968, Ser. No. 785,221

Int. Cl. F15c *1/12*

U.S. Cl. 137—81.5 **9 Claims**



This invention pertains to a combination of elements arranged in a plurality of stages which provides for the alternate forcing back and sucking in of a fluid in a capacitance, the frequency of which is adjustable. The arrangement provides cyclical pulsation of a fluid at an output device at a predetermined frequency which is set by the capacitance.

3,581,758

FLUIDIC-MECHANICAL OSCILLATOR

Norman Czajkowski, Chevy Chase, Md., assignor to the United States of America as represented by the Secretary of the Navy

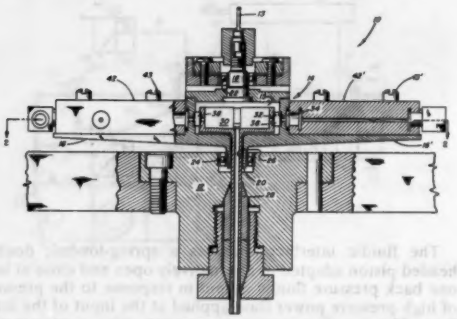
Filed Oct. 24, 1969, Ser. No. 869,030

Int. Cl. F15c *1/08, 3/00*

U.S. Cl. 137—81.5 **12 Claims**

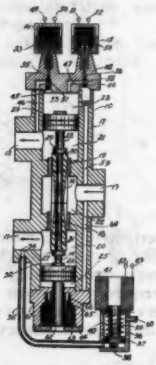
A fluidic mechanical oscillator having a bar with a central hollow hub mounted for rotating oscillation about an axis through the hub. A cylindrical drum rigidly mounted on a

low-pressure air pipe is enclosed within a closed hub chamber leaving an annular space between the interior wall of the rotating hub and outside wall of the fixed drum. Within the annular space are placed a pair of ribbon roll valves, each consisting of a closed loop of flexible material which rolls with the rotating hub to open a pair of ports in



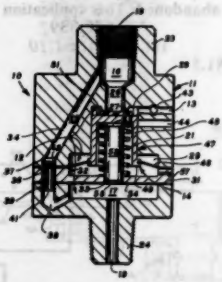
the hub wall for only a few degrees of the bar's oscillation and release a puff of pressurized fluid out of the ports. The fluid exits in a pair of jets at the ends of the bar directed tangentially and opposite to the direction of rotation of the bar and in phase with the oscillation. A portion of the jet is also released radially outward against an escapement release lever to provide the incremental time base for a timer.

3,581,759
CONTROL MEANS FOR PROPORTIONING AND MODULATING FLUID FLOW RATES TO REGULATE PRESSURES AND TEMPERATURES
Charles Clifford Veale, 950 Canyon View Drive, Laguna Beach, Calif.
Continuation-in-part of application Ser. No. 541,422, Mar. 7, 1966, now Patent No. 3,322,342. This application May 23, 1967, Ser. No. 642,285
Int. Cl. G05b *11/01*
U.S. Cl. 137—101.19 **18 Claims**



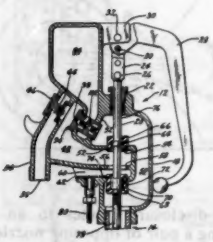
The invention covered in this application comprises a fluid pressure and temperature-sensing means for regulating preset pressure and temperature levels. U.S. Pat. No. 3,322,342 includes an electrical control and sensing system, coupled to a fluid flow rate modulating valve means. This invention, covered by Ser. No. 642,285, modifies said electrical system and valve to provide more precise flow rate control and better mixing principle for proportioned fluid flows. This invention also outlines a fully hydraulic fluid flow bridge which can be used in any hydraulic system where a modulated or servo-type movement is required from a remote control station, and for simple control applications or purposes of registration. Nonelectrical pressure and temperature-sensing means also are provided in said fluid flow control bridge. The systems also include flow rate proportioning means, having sensor-controlled rate-modulating means.

3,581,760
VALVE
Benjamin W. West, 237 La Espiral, Orinda, Calif.
Filed Feb. 14, 1969, Ser. No. 799,205
Int. Cl. G05d *7/01*
U.S. Cl. 137—115 **8 Claims**



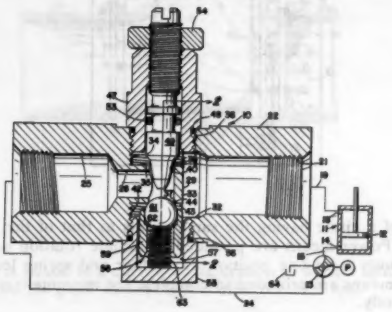
A valve is described for venting a first pressure region upon the occurrence of a drop in pressure in a second pressure region. Also described is a pneumatic sensing circuit using such a valve. The valve includes a housing defining a valve chamber in which a movable closure member operates to open and close a vent passage for the first pressure region. Upon a drop in pressure of the given magnitude in the second pressure region, the closure means moves to a position wherein the vent passage is opened to relieve pressure, in the first pressure region.

3,581,761
HYDRANT
Wayne B. Noland, Avon Lake, Iowa, assignor to Woodford Manufacturing Company, Des Moines, Iowa
Division of Ser. No. 640,676, May 23, 1967. Filed Mar. 28, 1969, Ser. No. 811,304
Int. Cl. E03b *9/14*
U.S. Cl. 137—209 **9 Claims**



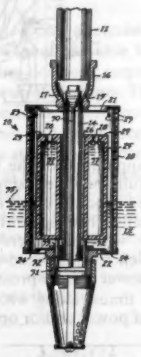
A hydrant having an inlet port and a discharge port with a fluid passageway therebetween, and an air compression chamber in communication with the fluid passageway wherein compressed air therein will purge the remaining fluid from the fluid passageway when the inlet port is closed.

3,581,762
SPEED CONTROL VALVE FOR FLUID MOTORS
Kenneth A. Bracki, Mount Prospect, Ill., assignor to Parker-Hanifin Corporation, Cleveland, Ohio
Filed Aug. 12, 1968, Ser. No. 751,939
Int. Cl. F16k 47/10
U.S. Cl. 137—271 3 Claims



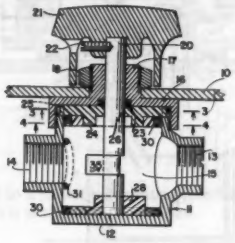
A speed control valve for fluid motors in which the flow passages through the valve body are formed by a first bore extending part way into the valve housing, a second bore of smaller diameter extending toward the first bore, a third bore extending transversely of the first and second bores and intersecting the first bore, a fourth bore connecting the second and third bores, and a valve element seating on the intersection of the third and fourth bores to control flow of fluid between the first and second bores. There may also be a fifth bore connecting the first and fourth bores and a second valve element seating on the intersection of the fourth and fifth bores to further control flow of fluid between the first and second bores.

3,581,763
LOW WATER CONTROL DEVICE FOR A WELL FOOT VALVE
Henry Leo Smith, Route 4, Box 63, Springfield, Tenn.
Filed Jan. 5, 1970, Ser. No. 704
Int. Cl. F16k 31/20
U.S. Cl. 137—430 7 Claims



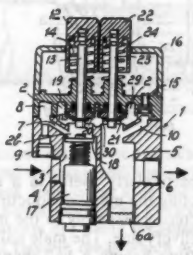
A foot valve for a well adapted to open and close a water inlet to the suction or tailpipe of the well pump when the pump is operative and inoperative respectively. A float body mounted in the well water to function as a float for all levels of well water above a predetermined safe low-water level, and to function as a weight or sinker for all water levels below the safe level, and a valve actuator adapted to be operatively engaged by the float body to hold the foot valve closed for water levels below the safe level.

3,581,764
REPLACEABLE CARTRIDGE UNIT
Robert J. Fife, Downers Grove, Ill., assignor to Crane Co., Chicago, Ill.
Filed Dec. 22, 1969, Ser. No. 886,855
Int. Cl. F16k 27/00
U.S. Cl. 137—454.2 14 Claims



A replaceable cartridge-type valve wherein the cartridge has incorporated therein a biased poppet valve, the seat of which faces exteriorly of the cartridge.

3,581,765
PUSHBUTTON-CONTROLLED VALVE FOR FEEDING FUEL GAS TO A BURNER FOR GAS STOVES OR THE LIKE, WITH A SYSTEM FOR VISUALIZING OPERATING CONDITIONS
Pier Luigi de'Stefani, Padova, Italy, assignor to Societa Italiana Tecnomeccanica "La Precisa" di Dr. Pier Luigi e Sig. Giancarlo de'Stefani, Padova, Italy
Filed Sept. 2, 1969, Ser. No. 854,664
Claims priority, application Italy, Sept. 19, 1968, 31855A/68
Int. Cl. F16k 37/00, 31/44
U.S. Cl. 137—553 6 Claims

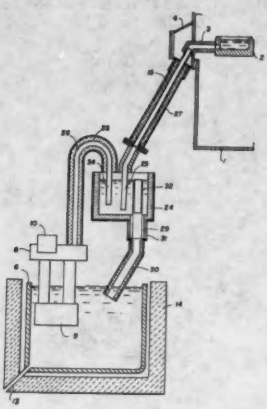


A valve device with tripping pushbutton control for fuel gas feeding to a burner, the pushbutton comprising a member shiftable by each actuation of the pushbutton and carrying indication marks appearing alternately through a window in accord with the actuation of the pushbutton.

3,581,766
SUPPLYING LIQUID TO A VACUUM CHAMBER
Joseph Paul Gimigliano, Pittsburgh, and John Francis Butler, Bethel Park, both of, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Filed Aug. 2, 1968, Ser. No. 749,741
Int. Cl. C23c 13/12
U.S. Cl. 137—563 8 Claims

Liquid is supplied to a receptacle in a vacuum chamber through a barometric leg, the outer end of which dips into a feed chamber. This chamber is interconnected with a reser-

voir by filling means including a pump and draining means arranged to maintain a flow of liquid between reservoir and

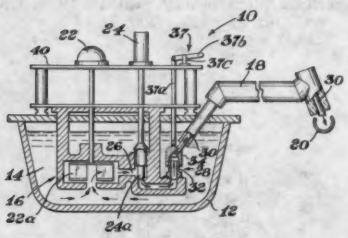


feed chamber. Means are provided to maintain a constant liquid level in the feed chamber.

3,581,767
COUPLING MEANS FOR CONNECTING MOLTEN METAL TRANSPORTING LINES

Gilbert C. Jackson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 1, 1969, Ser. No. 838,285
Int. Cl. F16k *1/00*
U.S. Cl. 137—563 **5 Claims**



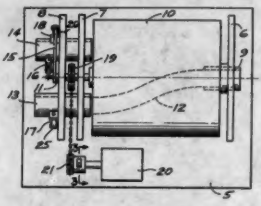
Coupling means particularly useful in a metal diecasting apparatus for connecting the metal-conducting passageway in the pumping and metering assembly to the metal-conducting passageway in the delivery line. The male half of the coupling comprises a stud fitting having a ball-shaped head portion and a lengthwise axial bore in communication with the outlet end of the pumping and metering assembly passageway. A female half of the coupling is defined by a bell-shaped fitting having a central lengthwise bore in communication with the inlet end of the delivery line passageway. A lower portion of the bore defines a frustoconical cavity having tapered sidewalls adapted to wedgingly engage the ball-shaped head portion of the stud fitting to provide an essentially liquidtight joint.

3,581,768
ICE DIVERTER VALVE

Robert F. Conti, Easton, Pa., assignor to Follett Corporation, Easton, Pa.

Filed Apr. 15, 1969, Ser. No. 816,248
Int. Cl. F16k *11/00*
U.S. Cl. 137—610 **5 Claims**

This invention is directed to a valve for directing the flow of ice from a single inlet source to any one of two or more receivers through separate ducts. The ice is passed from the single inlet to a selected outlet through a rotary valve body having a longitudinal duct having its inlet end axially aligned with the single inlet and its discharge end radially offset for selective registry with the outlets which are disposed on the

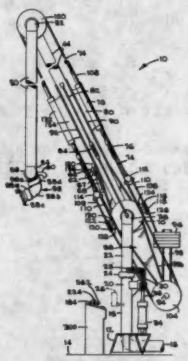


locus of a circle having the same radius as that of the duct offset. Power means are provided to initiate rotation of the valve body from one position to another and spring loaded toggle means are provided to complete the movement of the valve body.

3,581,769
POWERED BALANCE SYSTEM FOR A FLUID TRANSFERRING APPARATUS

Frank Haley, Upland, and Allan R. Bahlke, Fullerton, both of, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Sept. 27, 1968, Ser. No. 763,308
Int. Cl. B65g *53/30;* **F16l** *27/00;* **F17d** *1/00*
U.S. Cl. 137—615 **11 Claims**



A fluid transferring apparatus, of the marine loading arm variety, with an hydraulic-powered single-counterweighted system for balancing the apparatus and maneuvering it both horizontally and vertically. The apparatus is fully counterbalanced when it is filled with fluid, thereby imposing no load on the structure to which its outer end is connected during fluid transfer, and the power system provides positive control of the apparatus at all times, along with safeguards against accidents in the event of power and/or operator failure.

3,581,770
VALVE

Vincenzo Cerrato, Turin, Italy, assignor to Fram Corporation, East Providence, R.I.

Filed July 30, 1969, Ser. No. 846,199
Claims priority, application Italy, May 31, 1969, 4613-A/69
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.4 **4 Claims**

Valve assembly in a fluid flow system, a resilient plate being pivotally movable between an open portion spaced

from an arcuate valve seat and a closed portion in which the

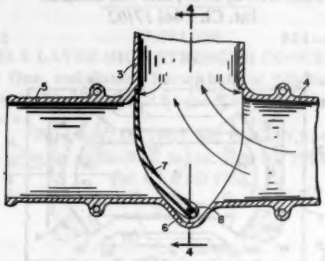


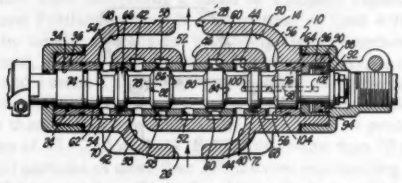
plate is flexed in a curved configuration to deflect fluid flowing past the plate without appreciable pressure loss.

3,581,771

POWER STEERING VALVE

Robert A. Garrison, Newport Beach, and Charles F. Schoelm, Long Beach, both of, Calif., assignors to Garrison Manufacturing Co., Inc., Santa Ana, Calif.

Filed Oct. 22, 1969, Ser. No. 868,508
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.69 4 Claims



A power steering valve comprising a housing having therein a single valve spool movable between a neutral position and two operating positions respectively located on opposite sides of the neutral position. The housing is provided with an inlet port connectable to a pump, a return port connectable to a reservoir, and two operating ports connectable to opposite ends of a steering cylinder. The valve is an open center valve so that, in the neutral position of the spool, fluid flows through the valve from the inlet port to the return port. The spool is provided with blocking lands which substantially block the two operating ports in the neutral position of the spool. This prevents any pressure feedback to the operator of the vehicle when the steerable wheels of the vehicle encounter obstructions, or the like.

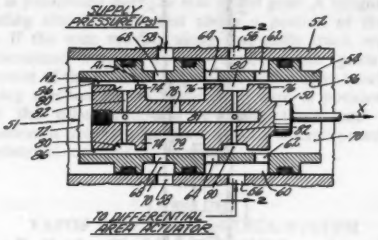
3,581,772

FRICTIONLESS SPOOL VALVE

Donald F. Wills, Suffield, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed June 30, 1969, Ser. No. 844,722
Int. Cl. F16k *11/07*; F16c *7/04*
U.S. Cl. 137—625.69 4 Claims

A spool valve having two spaced lands with two pairs of diametrically opposed hydrostatic pads on an intermediate portion of each land. The pads are formed by recesses on the periphery of the lands and supplied with a pressurized fluid by means of individual orifices which fluidly communicate with a supply conduit. A radial restoring results whenever the



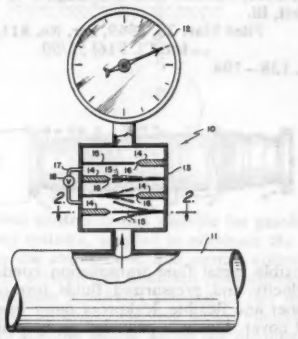
spool is moved to a radially eccentric position with respect to a bore in which it is slideably contained.

3,581,773

DEVICE FOR ATTENUATING PULSATION (DEADENER)

Kenneth H. Warren, 1500 Jupp Road, Glenn Burnie, Md.

Filed Aug. 27, 1969, Ser. No. 853,450
Int. Cl. F16l *55/04*
U.S. Cl. 138—26 5 Claims



A fluid pulse attenuation device or deadener which can be used for its general quieting abilities such as, for example, a filter in a feedback loop or as a device inserted between a pressure gage or similar measuring device in connection with a pipe whose contents are being measured. The device contains a number of flexible reeds which act as pulse attenuating variable orifices, resulting in a filtered, attenuated output and allowing accurate measurements when used with measuring devices.

3,581,774

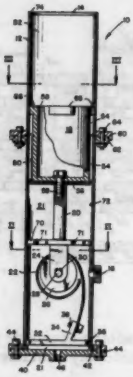
CONSTANT PRESSURE ACCUMULATOR

Ernest N. Oeland, Jr., West Covina, and Gary D. Drage, Kaysville, Utah. The United States of America as represented by the Secretary of the Navy

Filed Apr. 1, 1969, Ser. No. 811,922
Int. Cl. F16l *55/04*
U.S. Cl. 138—31 5 Claims

An accumulator for maintaining a substantially constant pressure above ambient in a hydraulic system including a hollow cylinder which has an opening at one location to ambient and an opening at another location for communication with the hydraulic system; a piston and pushrod disposed in the cylinder for reciprocatory movement between the open locations; and a negator spring which has an arcuate end which is

connected to the pushrod and an opposite end which is connected to the cylinder. A rolling diaphragm may be connected to an end of the piston and to the cylinder at a location about the piston wall.



3,581,775

FLEXIBLE CONDUIT FOR USE WITH BASIC OXYGEN FURNACES

John H. Dahl, Streamwood, Ill., assignor to Flex-Weld, Inc., Bartlett, Ill.

Filed Mar. 28, 1969, Ser. No. 811,295
Int. Cl. F16l *55/00*
U.S. Cl. 138—104 **3 Claims**

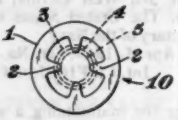
A flexible metal fluid transmission conduit for handling high-velocity and pressurized fluids formed by a flexible inner liner and flexible, leakproof outer line protected by a braided cover. Means is provided to maintain the inner line spaced from the outer line. Means is also provided to indicate failure of the inner line. The inner line is secured at its ends to the outer line through a clamping arrangement which permits removal and replacement of the flexible inner line. The outer lines may come in two sections, while the inner line is continuous.

3,581,776

PIPE INSULATION STRUCTURE

James P. Sheahan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 2, 1968, Ser. No. 764,416
Int. Cl. F16l *59/12*
U.S. Cl. 138—108 **3 Claims**



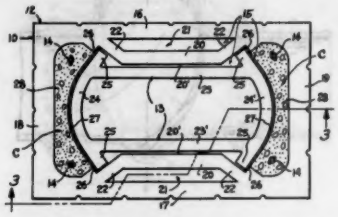
A flexible insulation structure for pipes, tubing and the like having a constant outer diameter and inwardly directed projections from its inner surface which permit the positioning of pipes of varying diameter within the structure.

3,581,777

CHIMNEY CONSTRUCTION

Douglas Luther Hodges, 1352 Johnson Ave., San Jose, Calif., and Elwood L. Eberhardt, 275 Leo Ave., San Jose, Calif.

Filed Oct. 3, 1969, Ser. No. 863,565
Int. Cl. E04f *17/02*
U.S. Cl. 138—114 **5 Claims**



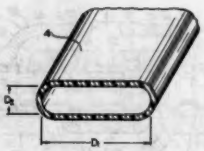
A chimney construction in which single unit blocks stacked about a flue lining are maintained in noncontact relation to minimize heat transfer and eliminate cracking of the structure and including a compressible barrier between the flue lining and the zones within the stacked blocks where reinforced cement grouting is to be poured.

3,581,778

OBLONG HOSE

Alfred Korejwa, Crestline; Walter J. Layer, and Richard E. Ruda, both of Bucyrus, all of, Ohio, assignors to Amerace Esna Corporation, New York, N.Y.

Filed Aug. 14, 1969, Ser. No. 849,951
Int. Cl. F16l *11/04*
U.S. Cl. 138—119 **15 Claims**



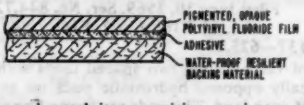
A hose is provided normally having an oblong inside transverse cross section and being of a material having elastic memory. In use, a source of fluid pressure coupled to one end of the hose will cause the hose's normal oblong inside transverse cross section to substantially circularize thereby permitting efficient movement of the fluid therethrough. However, upon interruption or cessation of the fluid pressure, the elastic memory of the material causes the hose to substantially immediately return to its normal oblong or flattened cross-sectioned shape thereby expelling any residual fluid therein through the hose's other end. Several processes for fabricating such hose are also disclosed.

3,581,779

LIGHTWEIGHT FLEXIBLE ROOFING LAMINATE AND ITS PREPARATION

Louis Gilbert Sylvia, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 28, 1961, Ser. No. 127,492
Int. Cl. F16l *9/14*; B32b *31/12*; E04d *1/20*
U.S. Cl. 138—141 **12 Claims**



10. A wrapped conduit comprising an inner continuous length of pipe, a layer of an insulation material and an outer

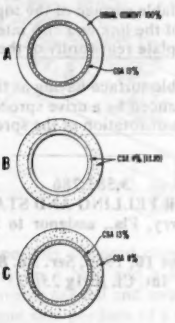
covering of an oriented, opaque, surface-receptive polyvinyl fluoride film laminated to a water-resistant, resilient, flexible backing material, said backing material maintained next to said insulation material.

3,581,780

DOUBLE LAYER HIGH STRENGTH CONCRETE PIPE

Yoshizo Ono, and Satoru Furui, both of Niigata, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1969, Ser. No. 817,514
Claims priority, application Japan, July 23, 1968, 43/51595
Int. Cl. F16l *9/08*
U.S. Cl. 138—175 **3 Claims**



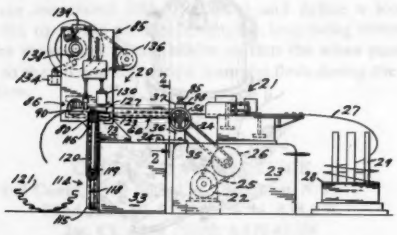
A reinforced concrete pipe having an inner layer and an outer layer, said outer layer comprising Portland cement and said inner layer comprising a blend of a cement expanding agent and Portland cement in a proportion of from 4:96 to 20:80 by weight, said cement expanding agent comprising a pulverized, sintered material having a molar CaO/Al_2O_3 ratio of 2/6 and a molar $CaSO_4/Al_2O_3$ ratio of 2/4, said pulverized, sintered material having a grain size distribution of particles of less than 44 microns representing less than 10 percent, particles of 44—250 microns representing more than 70 percent and particles of more than 250 microns representing less than 20 percent. A method of making a high strength reinforced concrete pipe, which comprises molding a reinforced concrete pipe having the above-noted composition, curing until said pipe has a strength sufficient to resist the mold releasing, releasing said pipe from the mold and subjecting said pipe to curing.

3,581,781

WIRE FORMING APPARATUS

Alton O. Demlow, Adrian, Mich., assignor to Demlow & Son, Clayton, Mich.

Filed May 1, 1969, Ser. No. 820,812
Int. Cl. B21f *1/04, 35/04*
U.S. Cl. 140—71 **11 Claims**



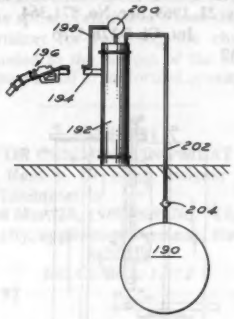
A wire forming apparatus for use on a continuous length of generally flat sinuously bent wire. Drive mechanism including a motor driven star wheel gear discharges the wire onto one end of a longitudinally ending guide track. An adjustment device is provided for manually rotating or adjusting the rotative position of the star wheel gear to increase or decrease the tension force on the wire. A vertically movable crowning block is positioned over the star wheel gear. A longitudinally extending arm is positioned above a portion of the guide track. If the wire moving along the guide track reaches a predetermined vertical elevation above the guide track, movement of the arm operatively stops the drive mechanism. Shearing mechanism for cutting the wire is positioned adjacent the other end of the guide track and control mechanism is provided for actuating the shearing mechanism at predetermined intervals.

3,581,782

VAPOR EMISSION CONTROL SYSTEM

George R. Onufer, Bloomfield Hills, Mich., assignor to Russell, Burdsall & Ward Bolt and Nut Co., Livonia, Mich.

Filed Dec. 23, 1968, Ser. No. 786,129
Int. Cl. B65b *31/06;* **B01d** *53/14*
U.S. Cl. 141—59 **12 Claims**



A vapor emission control system suitable for gasoline and other fuel delivery systems, adapted to eliminate the escape of fuel vapors to the atmosphere, and permit utilization of these vapors by the system. The disclosed embodiment of the control system includes a delivery conduit or line having a fuel delivery nozzle, an annular sealing means encircling the nozzle adapted to seal the nozzle within the opening to the container or tank, a vapor return line which may be vacuum operated, and a filter or other means adapted to store the vapors. In the disclosed embodiment of the nozzle assembly, the sealing means includes a flexible annular sleeve which is received within the container opening. The sleeve is expandable in one of the disclosed embodiments to seal the tank opening. In another embodiment, the sealing means is provided with a spring-tensioned annular sealing ring adapted to seal the opening to the tank. In the latter embodiment, the vapors are conducted through apertures in the sleeve to the vapor return line.

3,581,783

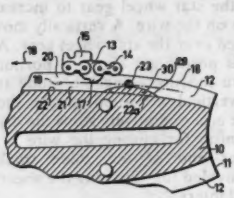
LUBRICATING MEANS FOR CHAIN SAW BAR

Karl Lennart Sandin, Gavle, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden

Filed Sept. 24, 1969, Ser. No. 860,710
Claims priority, application Sweden, Sept. 30, 1968, 13155
Int. Cl. B27b *17/12*
U.S. Cl. 143—32 **8 Claims**

An arrangement is disclosed for lubricating the guide bar and chain of a chain saw. The guide bar has an oil hole extending to the groove in which the tangs of the center links slide. The general depth of the groove is greater than the tang length so that the ends of the tangs move along a path spaced from the bottom of the groove. The oil hole is at a

level above the path of the bottom ends of the tangs, and the bottom of the groove is shallow at that zone. Hence, as the



oil enters, it is retained at that level and is picked up and carried away by the tangs.

3,581,784

SAW TABLE INSERT

Edward C. Warrick, Pittsburgh, Pa., and Emerson Berends, Tupelo, Miss., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.

Division of Ser. No. 684,437, Nov. 20, 1967, abandoned. This application Nov. 21, 1969, Ser. No. 871,364

Int. Cl. B27b *5/16*

U.S. Cl. 143—132 **1 Claim**

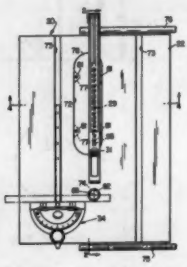


Table saw blade opening closure plate means providing means for levelling adjustment from above the work table by the operator standing in operating position.

3,581,785

TOP SHARPENING CUTTER LINK FOR SAW CHAIN

Albert Neumeier, Milwaukie, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed July 22, 1963, Ser. No. 296,521

Int. Cl. B27b *33/14*

U.S. Cl. 143—135 **4 Claims**

1. In a top sharpening saw chain link,
the link being solely a one-piece, continuous, formed sheet of metal and including:

a body plate having a pair of pivot portions and also having a forward end, a rear end and an outer edge portion,

an elongated top plate,

a shank connecting one edge portion of the top plate to the outer edge portion of the body plate,

the entire top plate being to the rear of the midpoint of a line joining the pivot portions,

the top plate being steeply inclined relative to said line and extending longitudinally rearwardly and inwardly relative to the body plate and at least the outer portion of the top plate lying in a plane tilted to a predetermined extent from the normal to the body plate,

the forward, outer end of the top plate comprising an arcuate, abradable surface intersecting the forwardly and inwardly facing face of the top plate to form an acute cutting edge therewith which extends laterally and rearwardly relative to the body plate from the end of the cutting edge nearer to the shank and lies substantially in a plane normal to the body plate,

the arcuate, abradable surface of the top plate being the outermost portion of the link and also intersecting the outer face of the top plate rearwardly of the cutting edge,

the arcuate abradable surface having as the center thereof, when the link is advanced by a drive sprocket of a chain saw, the axis of rotation of the sprocket.

3,581,786

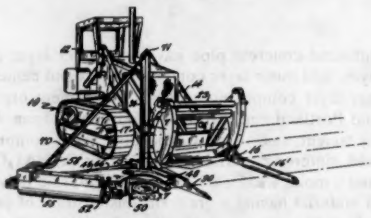
APPARATUS FOR FELLING AND STACKING TREES

Matt A. Rigoni, Perry, Fla., assignor to Fleco Corporation, Jacksonville, Fla.

Filed June 10, 1969, Ser. No. 831,877

Int. Cl. A01g *23/02*

U.S. Cl. 144—3 **13 Claims**



A combination tree feller and stacker includes a fork lift and grapple having a tree shearing mechanism mounted on one of the arms of the fork so that a sheared tree falls across the fork and a plurality of trees may be successively sheared and held on the fork to expedite cutting and stacking of the trees.

3,581,787

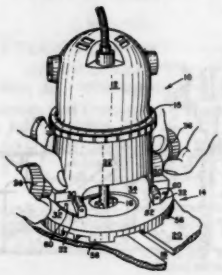
TRANSPARENT BASE FOR ROUTER

John H. Bane, Jackson, Tenn., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed Aug. 1, 1969, Ser. No. 846,826

Int. Cl. B27c *5/10;* **B23c** *1/20*

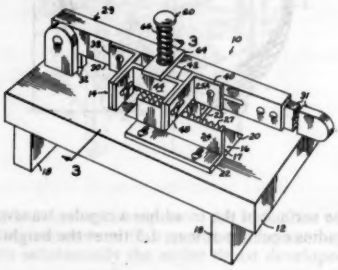
U.S. Cl. 144—134 **9 Claims**



A router comprising a transparent, abrasion resistant, subbase having ribbed sections which engage the workpiece and

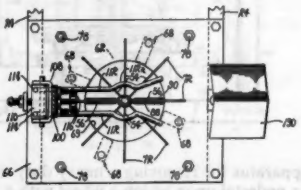
recessed viewing sections which do not contact the workpiece. The recessed sections function as unabraded and unscratched vision areas which provide an operator with an undistorted view of the cutting action of the tool on the workpiece.

3,581,788
NUT SHELLING DEVICE
Clifton L. McCoy, R.R. 2 Box 685, Oklahoma City, Okla.
Filed Oct. 2, 1969, Ser. No. 863,183
Int. Cl. A23n *5/00*
U.S. Cl. 146—13 **5 Claims**



A plurality of oppositely disposed cooperating blades are mounted respectively on a base and a lever pivotally connected with and movable toward and away from the base so that opposite ends and side portions of a nut hull are cut off when the nut is positioned on the base mounted blades and the lever mounted blades are moved toward the base.

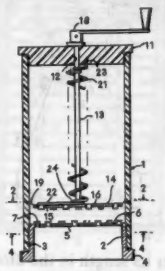
3,581,789
FRUIT SLICING AND PITTING MACHINE
Aram J. Torosian, 3350 E. Alta Ave., Fresno, Calif.
Filed Jan. 21, 1969, Ser. No. 792,247
Int. Cl. A23n *3/08*
U.S. Cl. 146—28 **8 Claims**



A machine for slicing and pitting fruit, such as peaches and the like, having an edible mesocarp, or flesh, and a substantially central endocarp, or pit. The machine includes a plurality of radially arranged resiliently outwardly movable blades. The peach is fed through the blades which slice the flesh and are engaged by the pit for outward camming movement in response to passage of the pit. A cutting wire or wires are associated with the blades and define a loop in which the tip of the pit is received, the loop being distended with the movement of the blades so that the wires pass adjacent to the pit and separate it from the flesh during the slicing action.

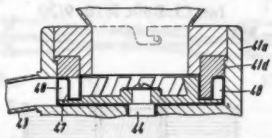
3,581,790
CHEESE GRATING DEVICE
Mario Del Conte, 1860 E. 3rd St., Brooklyn, N.Y.
Filed June 20, 1969, Ser. No. 835,036
Int. Cl. A23c *19/00*; **A47j** *43/04*
U.S. Cl. 146—177 **11 Claims**

A hand held cheese grating device having a cylinder body fitted with a stationary lower grating member upon which a slug of cheese is rested and caused to be grated as an upper grating member is relatively rotated by means of a drive shaft. Cheese gratings fall through openings in the lower member and exit from the bottom of the cylinder. A compression spring constantly urges the upper member down upon the cheese. Any cheese gratings that might be forced



upwardly through perforated grating formations to the upper surface of the upper member are swept over the edge of the latter to the openings in the lower member by means of a terminal arm of the spring, relative to which the upper member rotates. A container for receiving the cheese gratings is detachably mounted to the bottom of the device. The drive shaft is subject to manual or motorized operation.

3,581,791
APPARATUS FOR COMMINUTING MEAT OR THE LIKE
Friedrich Otto, Hameln, Germany, assignor to Belder Trust Reg., Vaduz, Liechtenstein
Filed Mar. 28, 1968, Ser. No. 716,846
Claims priority, application Germany, Nov. 29, 1967, St27616
Int. Cl. B02c *18/12*
U.S. Cl. 146—192 **6 Claims**

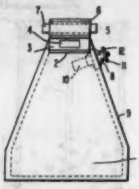


A comminuting apparatus for meat or other mincible materials comprises two concentric annuli of teeth the inner of which rotates with reference to the outer annulus. The material is fed into the area within the inner annulus of teeth and is comminuted during travel between the teeth and radially outwardly beyond the outer annulus. The thus comminuted material enters a ring-shaped chamber of the housing which latter accommodates the teeth, and such material is immediately expelled into the outlet by one or more vanes which rotate with the inner annulus of teeth around the outer annulus. Rapid evacuation of comminuted material prevents discoloration which develops if a batch of comminuted material is allowed to dwell in the housing for extended periods of time.

3,581,792
IMPACT-RESISTANT CONTAINER FOR LIQUIDS
Richard Weiss, Troisdorf; Alfred Romanowski, Kleineichen; Manfred Simm, and Heinrich B. Strack, Troisdorf, all of, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed Feb. 17, 1969, Ser. No. 799,842
Claims priority, application Germany, Feb. 22, 1968, P 15 56 421.3
Int. Cl. B65d *39/00, 37/00*
U.S. Cl. 150—8 **7 Claims**

A container for fluids, particularly for liquids to be subjected to extreme impact forces, for example, as created by

free fall from an aircraft in flight, which container is formed from a thermoplastic synthetic resin or similarly elastic material, and including an improved filling and drain construction comprising a substantially rigid pipe section secured to an opening in the wall of the container and extending outwardly therefrom, which pipe section has a wall thickness



which decreases over its length in the direction of the interior of the container, and a thin-walled tubular section secured at the opening in the wall of the container and extending inwardly for a substantial distance, two lateral edges of the tubular section being welded to flatten the thin-walled member and cause the tubular section to function as a check valve.

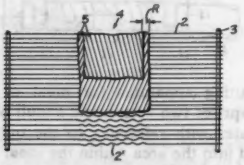
ERRATUM

For Class 152—220 see:
Patent No. 3,581,797

3,581,793
PNEUMATIC VEHICLE TIRE

Hermann Wittneben, Hannover, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Dec. 16, 1968, Ser. No. 784,012
Claims priority, application Germany, Dec. 15, 1967, P 16 05 642.1
Int. Cl. B60c *9/10, 9/20*
U.S. Cl. 152—354 **8 Claims**



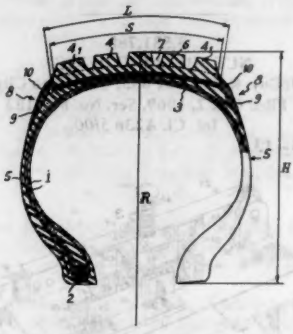
A pneumatic vehicle tire having a tread strip and being provided with a pull-resistant belt extending substantially over the width of the tread strip and comprising pull-resistant strength members forming an acute angle with the circumferential direction of the tire, said tire also comprising a carcass with strength members extending into the vicinity of said belt, those portions of said carcass strength members which are adjacent said belt being at least locally undulated.

3,581,794
REINFORCED TREAD TIRE

Rene Heuze, Ermont; Jean Menin, Maurecourt, and Henri Plubel, Gratien, all of, France, assignors to Pneumatiques, Caoutchouc Manufacture Et Plastiques Kleber-Colombes, Colombes, France

Filed Dec. 6, 1968, Ser. No. 781,720
Claims priority, application France, Dec. 8, 1967, 131648
Int. Cl. B60c *9/14*
U.S. Cl. 152—361 **1 Claim**

This invention relates to radial ply pneumatic tires, of the kind where the tread is reinforced by a reinforcing strap. According to this invention, the reinforcing strap throughout its width is substantially parallel to the tread surface. Moreover, it is wider than the surface of the tread when new and is at least equal to the maximum width of the tread surface after

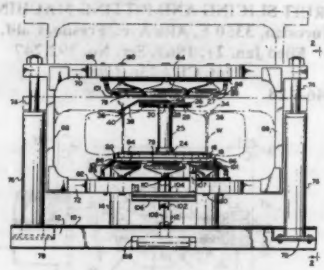


wear. The surface of the tread has a regular transverse curvature of radius equal to at least 1.3 times the height of the tire section.

3,581,795
HEAVY DUTY TIRE REMOVING APPARATUS

G. W. Bunch, Jr., 3005 S.E. 147th Ave., and Bruce C. Johnson, 14204 S.E. Tibetts, both of Portland, Oreg., assignor to said Johnson, by said Bunch

Filed Dec. 2, 1969, Ser. No. 881,477
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.2 **10 Claims**



An apparatus for removing a heavy duty tire from a wheel having a pedestal upon which a wheel with a tire thereon can be mounted and means for securing the wheel to the pedestal. A pair of parallel spaced coaxial pressure rings are mounted in circumscribing relation to the pedestal. A plurality of ring segments or fingers are pivotally mounted on the inner peripheral surfaces of the pressure rings. Each of the fingers has a reversely curved bead contacting portion which is adapted to slide between the beads of the tire and the rim of the wheel and contact substantially the entire bead area of the tire. The pressure rings are first lowered and then raised in fixed parallel spaced relation whereby the fingers on the upper ring separate the bead from the rim on the top side of the tire and the fingers on the lower ring separate the bead from the rim on the bottom of the tire and lift the tire from the wheel.

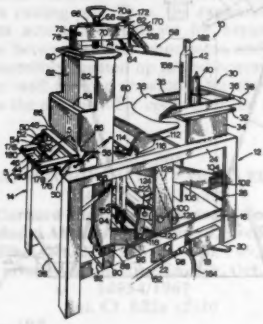
3,581,796
TIRE CHANGER

Erhard J. Alm, 415 Heath Street East, Toronto 17, Ontario, Canada

Filed Oct. 31, 1968, Ser. No. 772,124
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.28 **9 Claims**

A tire changer is described with particular reference to the bead breaker portion thereof. The bead breaker comprises

two bead breaker jaws which are axially opposed and which may be operated singly or in combination. The thrust developed in the machine is directed proportionately to each



of the bead breakers with respect to the resistance which the bead breaker encounters; thus each bead breaker operating singly exerts substantially the entire thrust developed in the machine.

3,581,797

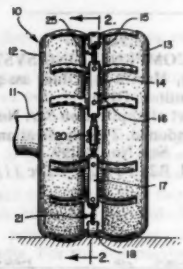
TRACTION UNIT AND ASSEMBLIES FOR USE WITH DUAL TIRE WHEEL ARRANGEMENT

Walter F. Kinnucan, 6729 S. Crandon Ave., Chicago, Ill.

Filed June 11, 1969, Ser. No. 832,079

Int. Cl. B60c *27/22*

U.S. Cl. 152—220 **12 Claims**



A traction unit for a dual tire wheel arrangement includes a rocker arm positioned in the well between the dual tires, and a pair of traction plates, each affixed to one end of the rocker arm and each having a pair of wing portions extending outwardly over the tire treads. In one assembly the units are positioned in place on the tires without any joinder to the dual tire arrangement, by a plurality of connecting units between adjacent traction units, such as chain links, T-bolt assemblies, and/or turnbuckles. In another assembly a single traction unit is affixed through a hole in the spacer between the tire rims, by an arrangement comprising a pair of chains extending from the ends of the rocker arm downwardly to an eyebolt extending through the spacer unit.

3,581,798

VENETIAN BLIND CONSTRUCTION

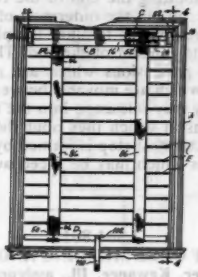
Josef Malamed, 281 Fifth Ave., New York, N.Y.

Filed Apr. 14, 1969, Ser. No. 815,645

Int. Cl. E06b *9/30, 9/306*

U.S. Cl. 160—168 **8 Claims**

A combined venetian and roller blind having a header housing, a curtainlike spring actuated roller in the housing, tiltable slats and a bottom bar. Opposed tapes are disposed on both sides of the slats, with seats between the tapes for said slats, one end of the tapes fixed to the tilting bar and the other end to the bottom bar. A single hand loop strap is secured to both long edges of the bottom bar serving as a handle for actuating the tilting bar and slats and for raising



and lowering the blind. Plastic or magnetic means is provided in the header housing for moving the tilting bar with braking action until the bar comes to rest against stops limiting the slats between open and closed positions.

3,581,799

WOVEN MATERIAL PARTICULARLY FOR USE IN SUN BLINDS

Fritz W. Bischoff, c/o Perfesto (Cedarwood) Blinds (Proprietary) Limited, Darling Street, Port Elizabeth, Cape Province, Republic of South Africa

Filed Apr. 23, 1969, Ser. No. 818,706

Claims priority, application Republic of South Africa, May 8, 1968, 68/6695

Int. Cl. E06b *9/10*

U.S. Cl. 160—231 **7 Claims**

A material suitable for use in making rollup-type sunblinds comprising narrow adjacent slats woven together by means of flexible binding extending at right angles to the lengths of the slats, the slats being positioned such that the side surfaces thereof are at roughly right angles to the surfaces of the woven material and the edges of the slats face the surfaces of the woven material.

3,581,800

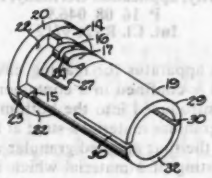
END PLUG FOR ROD

Joseph L. Nelson, Freeport, Ill., and James A. Anderson, Muskegon, Mich., assignors to Newell Mfg. Co., Freeport, Ill. and Breneman Inc., Cincinnati, Ohio, part interest to each

Filed Mar. 26, 1969, Ser. No. 810,596

Int. Cl. A47h *1/022*; E06b *9/20*

U.S. Cl. 160—323 **7 Claims**



A one-piece molded end plug for insertion in the end portion of an elongated window shade rod with the end plug

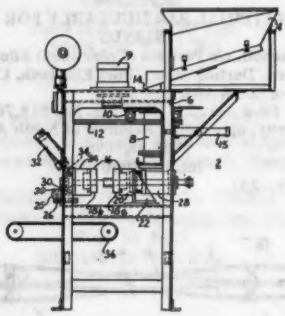
being movable relative to the end of the rod between a number of preselected positions so as to adjust the effective length of the rod. In each of the positions, a portion of the plug positively abuts the end of the rod to prevent unintended further insertion of the plug into the rod. The portions of the plug abutting the end of the rod in the various positions are stops, all but the outermost of which are selectively movable or removable to allow the plug to be inserted further into the end portion of the rod. The two innermost stops are flexible protrusions which are molded integrally with the plug and which are movable between retracted positions in which they may telescope into the rod and extended or normal positions in which they abut the end of the rod. The next to the outermost stop is formed by a number of angularly spaced tabs which may be sliced away and removed from the plug.

3,581,801

METHOD OF CORE MOLDING AND EJECTING

Gary L. Hulslander, Kewanee, Ill., assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Mar. 3, 1969, Ser. No. 803,782
Int. Cl. B22c *13/12*
U.S. Cl. 164—22 **11 Claims**



A method of making cores with a horizontally reciprocating mold half to open and close a core box. When closed, a charge of molding sand or curable material is blown into the cavity of the core box. The sand is cured by suitable means, and then the mold halves separate, retaining the core in one of the mold halves which is then pivoted about 90° to face downwardly. The core is then ejected by ejector pins to drop only a very short distance onto a soft conveyor, hence core breakage is eliminated.

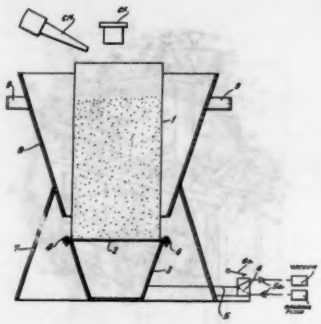
3,581,802

METHOD FOR MAKING CASTINGS

Erich Krzyzanowski, Frankenthal, Pfalz, Germany, assignor to Grunzweig & Hartmann Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed Jan. 31, 1969, Ser. No. 795,570
Claims priority, application Germany, Feb. 3, 1968, P 16 08 046.9
Int. Cl. R22c *9/12*
U.S. Cl. 164—34 **7 Claims**

A method and apparatus for making castings. A body of granular material is confined in a container and a stream of gaseous fluid is introduced into the bottom of the container to impart to the granular material a state at least approaching fluidization. Into the thus agitated granular material a form is introduced consisting of a material which is subject to consumption on contact with a molten metal. Admission of gaseous fluid is terminated to permit settling and compacting of the granular material about the form. Molten metal is introduced into the form to assume the configuration of the same while simultaneously consuming the form. Gaseous fluid is then again admitted into the container to agitate the



granular material for facilitating removal of the finished casting therefrom.

3,581,803

METHOD OF REDUCING CENTER POROSITY IN INGOT CASTING

Charles W. Finkl, 2011 N. Southport, Evanston, Ill.

Filed May 24, 1968, Ser. No. 731,721
Int. Cl. B22d *27/16*
U.S. Cl. 164—65 **6 Claims**

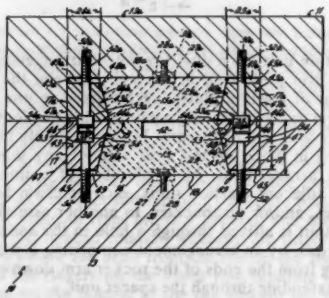
A method of reducing porosity in the center of ingots promoting a uniform temperature gradient, and decreasing alloy segregation by vacuum stream degassing into an ingot mold and simultaneously gas purging from the center of the ingot stool to facilitate a thermal circulation.

3,581,804

EXPANSION GAP COMPENSATING SYSTEM FOR A DIE

Joseph A. Woltering, Hamilton, Ohio, assignor to Hamilton Die Cast, Inc., Hamilton, Ohio

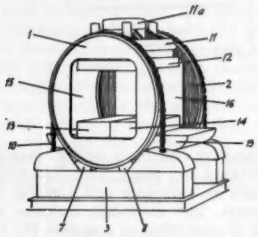
Continuation-in-part of application Ser. No. 737,480, June 17, 1968, now abandoned. This application May 11, 1970, Ser. No. 36,299
Int. Cl. B22d *17/24*; B29c *11/00*
U.S. Cl. 164—137 **23 Claims**



An expansion gap compensating system for a die that is especially useful in the area of high-temperature diecasting, e.g., at temperatures of about 1,300° F. and up. When a die's impression block is fabricated of a metal having a different expansion coefficient than that of the die's holding block crevasses or expansion gaps tend to open between the two blocks upon heating of the die assembly to high temperature from room temperature. The width of these expansion gaps may vary from thousandths of an inch to hundredths of an inch or more, and is mainly dependent on the difference in expansion coefficients of the block metals and on the casting

or operating temperature. The system of this invention permits an impression block and a holding block fabricated of, for example, a refractory metal and a steel respectively, (a) to be simply and easily assembled and maintained together as a die in tight and safe operating relation without damage to either, and (b) to be maintained in an exact centered or preset position relative one to another, at all times throughout a casting run. Thus, the expansion gap compensating system acts to compensate for expansion gaps that tend to open between related impression and holding blocks as the die assembly is heated up to and operated at high temperatures, as well as to compensate for the contracting of those gaps as the die assembly cools after the casting run.

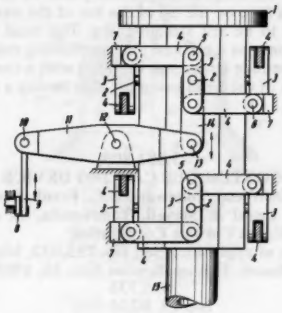
3,581,805
MOULDING MACHINE WITH PARALLEL CIRCULAR WALL ELEMENTS
Olof Johan Gerhard Hedberg, Halmstad, Sweden, assignor to Malcus Industri Aktiebolag, Halmstad, Sweden
Filed Oct. 22, 1968, Ser. No. 769,567
Claims priority, application Sweden, Oct. 30, 1967, 14854/1967
Int. Cl. B22c *15/30*
U.S. Cl. 164—192 **18 Claims**



A molding machine for compacting molding sand or other molding material in a molding box comprises two discs mounted for rotation in two parallel vertical planes. A pair of plates are mounted between the discs parallel to each other and normal to the discs. One of the plates can be moved toward the other and also vibrated or jolted for compacting molding sand in a box inserted between the plates either through openings in the discs or in the direction parallel to the discs. The discs together with a box placed between the plates are turnable either into a sand-charging position or a sand-compacting position by being supported on rollers mounted on a cradle. For the compacting operation the discs are separated from these rollers and supported by stationary supports.

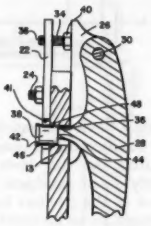
3,581,806
SUSPENSION SYSTEM FOR LINEARLY MOVING THE LIFTING STAGE OF THE MOLD IN A CONTINUOUS CASTING APPARATUS
Otto Neumann, and Herbert Jennes, both of Monchengladbach, Germany, assignors to Mannesmann-Meer A.G., Monchengladbach, Germany
Filed Dec. 11, 1968, Ser. No. 783,045
Claims priority, application Germany, Dec. 28, 1967, M76734
Int. Cl. B22d *11/00;* **F16h** *21/44*
U.S. Cl. 164—260 **10 Claims**

A suspension system for linearly reciprocating the lifting stage of a continuous casting process mold relative to a fixed structure, an elongated double lever having first and second ends, a pivot for supporting the lever intermediate the first and second ends, a first plate pivotally secured to the second end of the lever and to the lifting state, a plurality of articulated plates, one end of each of which being pivotally secured to the lifting stage, the other end of each of which being pivotally secured to the fixed structure, and drive means pivotally secured to the first end of the lever whereby the lever is arranged to move angularly relative to the pivot and the suspension system is adapted to generate a lemniscate



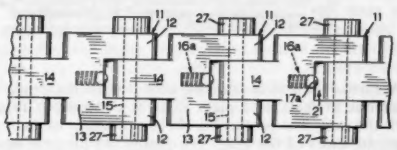
curve, the lifting stage movements being derived from the substantially straight portion of the lemniscate curve.

3,581,807
BULLET MOLD
Allen F. Taylor, 16224 N. 37th Place, Phoenix, Ariz.
Filed Nov. 1, 1968, Ser. No. 772,578
Int. Cl. B22d *25/02, 31/00*
U.S. Cl. 164—264 **5 Claims**



A bullet mold for molding bullets of the wad cutter type which are generally cylindrical and having flat nose portions and base portions; comprising three plates, one of which has a cylindrical cavity therein, another of which has a sprue opening and cutter, and the other of which forms a backup plate for the opposite end of the cylindrical cavity from the sprue cutter, and means for pivotally shifting the sprue cutter and the backup plate out of alignment with the cavity in order to eject a cylindrical bullet therefrom.

3,581,808
STARTING DEVICE FOR CONTINUOUS CASTING MACHINE
Tibor Miklos Vertesi, Whitbey, Ontario, and Bruce Allan Phillips, Ajax, Ontario, both of, Canada, assignors to Gamma Engineering Limited, Whitby, Ontario, Canada
Filed Dec. 26, 1968, Ser. No. 786,883
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 **11 Claims**

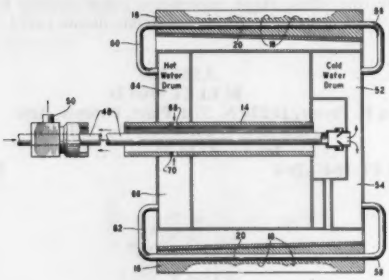


pair of arms joined by a root, and a bar extending from the root, the bar of one link being pivoted between the arms of the next link. Two pawls in the root of each link, one pawl on each side of the longitudinal center plane of the link, press against a cam face on the tip of the bar of the next link, causing the links to be self straightening. The head assembly of the device contains a pivoted joint permitting rotation in one direction to reduce stresses at its union with a cast strand, the pivoted parts of the head assembly also having a pawl for self straightening.

3,581,809
CONTINUOUS CASTING DEVICE

Richard D. DeWeese, Tonawanda; C. Frank Young, Niagara Falls, and Loyal A. Stoyell, Tonawanda, all of, N.Y., assignors to Union Carbide Corporation

Continuation of application Ser. No. 715,032, Mar. 21, 1968, now abandoned. This application Nov. 26, 1969, Ser. No. 873,735
Int. Cl. B22d *5/02*
U.S. Cl. 164—325 **3 Claims**

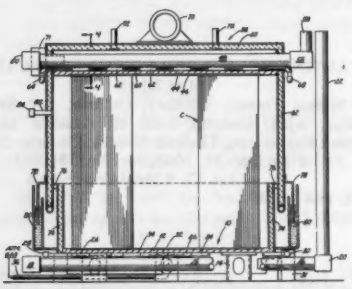


A continuous casting device comprising a rotating mold having a plurality of cavities on its outer surface into which molten metal is poured. As the device rotates, the metal solidifies and properly sized products in the shape of the cavities are drawn out of the cavities by the force of gravity as the cavities are rotated to an inverted position.

3,581,810
METALLURGICAL FURNACE

Calvin C. Blackman, 24272 W. Lake Road, Bay Village, Ohio

Continuation-in-part of application Ser. No. 750,830, Aug. 7, 1968, now abandoned. This application July 16, 1969, Ser. No. 857,253
Int. Cl. F25b *29/00*
U.S. Cl. 165—2 **30 Claims**

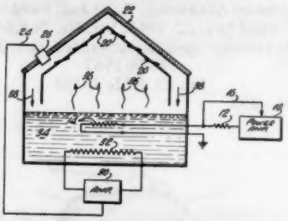


A furnace for heat-treating coiled strip material. The furnace has at least one plate in heat conductive relationship with the coil, and preferably there are a pair of such plates at opposite ends of the coil. The plates are directly heated and directly cooled to provide rapid heat transfer to and from the coil. In one embodiment intermediate sections are provided for disposition between stacked coils. The intermediate sections have directly heated top and bottom plates in conductive relationship of the edges of the coils directly above and below.

3,581,811
CONSTANT TEMPERATURE BATH FOR HIGH POWER PRECISION RESISTOR

Loebe Julie, New York, N.Y., assignor to Julie Research Laboratories, Inc., New York, N.Y.

Division of Ser. No. 523,168, Jan. 26, 1966, Pat. No. 3,503,030. Filed Aug. 4, 1969, Ser. No. 858,230
Int. Cl. B60h *1/00*
U.S. Cl. 165—39 **7 Claims**

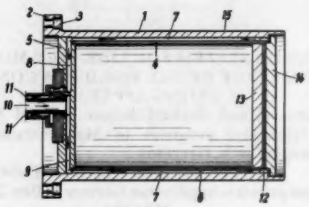


A high dissipative electronic device, such as a precision resistor, is immersed in a liquid bath. The bath, of a dielectric liquid, is within an enclosure and a heater heats the bath to its boiling point. The enclosure includes a heat exchange means which is controlled to maintain the bath temperature constant.

3,581,812
HEATED GODET FOR DRAWING SYSTEMS AND CYLINDER DRYERS

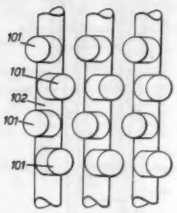
Heinz Fleissner, and Gerold Fleissner, both of Egelsbach near Frankfurt (Main), Germany, assignors to Vepa AG, Basel/Schweiz, Germany

Filed Apr. 23, 1969, Ser. No. 818,761
Claims priority, application Germany, Apr. 25, 1968. Dec. 20, 1968, P 17 60 256.1 and P 18 16 001.5
Int. Cl. F28d *11/02*
U.S. Cl. 165—89 **16 Claims**



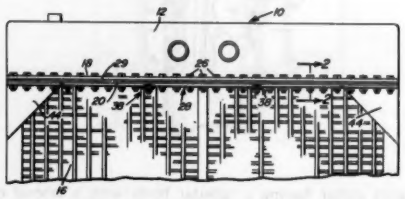
A godet which comprises a cylindrical outer jacket and a cylindrical inner jacket provided with a front face and a rear face, said outer and inner jacket defining an annular chamber therebetween, paraxially disposed means for subdividing the annular chamber into a plurality of chambers, at least two adjacent chambers communicating with each other at the front face of the godet, and at least one supply and discharge line connected with the chambers which are in communication with each other.

3,581,813
HEAT EXCHANGERS
Alan Bell, London, England, assignor to Foster Wheeler John Brown Boilers Limited, London, England
Filed Apr. 15, 1969, Ser. No. 816,325
Claims priority, application Great Britain, Apr. 16, 1968, 18001/68
Int. Cl. F28f 19/02
U.S. Cl. 165—157 2 Claims



The heat exchanger comprises a bank of substantially straight and parallel tubes surrounded by a shell, the bank being constituted by juxtaposing adjacent layers of tubes, each layer extending between its own inlet and outlet manifolds. With such an arrangement, it is easy to provide a tube bank where the tubes lay in line with one another when the bank is viewed from above or from one side and this does not give optimum heat transfer between fluids within the tubes and fluids passed across the tubes in the tube bank. According to the present invention, the adjacent tubes in each layer are deflected by springing from near their ends so that alternate tubes in one layer are deflected in opposite ways and adjacent tubes in adjacent layers are deflected in the same way, to give better heat transfer efficiency.

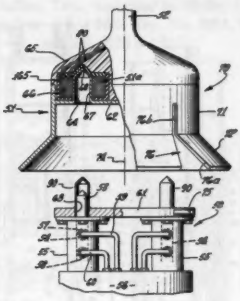
3,581,814
RADIATOR COMPRESSION STRAP
Richard A. Jackson, 57 Fairview Lane, Mount Iron, Minn.
Filed May 9, 1969, Ser. No. 823,441
Int. Cl. F28d 7/00
U.S. Cl. 165—134 4 Claims



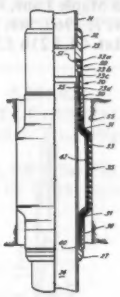
An elongated rigid strap for backing abutted radiator end tank and core body flanges. The flanges are bolted together with bolts spaced longitudinally therealong and secured therethrough and the strap backs one of the flanges and has a longitudinal slot formed therein through which the bolts are also passed. A plurality of removable clips are spaced along the strap and embracingly receive the opposite side surfaces of the strap between spaced opposing portions thereof for preventing the portions of the strap on opposite sides of the slot from spreading apart, each clip having one of the aforementioned bolts secured therethrough.

3,581,815
UNDERWATER CONNECTOR WITH RETRIEVABLE SEALED ELECTRICAL ASSEMBLY
Fernando Murman, Palos Verdes Peninsula, Calif., assignor to Hydril Company, Los Angeles, Calif.
Filed Feb. 17, 1969, Ser. No. 799,735
Int. Cl. E21b 43/01
U.S. Cl. 166—.5 21 Claims

The disclosure concerns unusually advantageous method and apparatus for controlling a stack of underwater wellhead equipment, utilizing a sealed electrically energizable element lowered underwater into operative proximity to a fluid pressure control adapted to be actuated in response to energization of the element.



3,581,816
PERMANENT SET INFLATABLE ELEMENT
Billy C. Malone, Houston, Tex., assignor to Lynes, Inc., Houston, Tex.
Filed Mar. 5, 1970, Ser. No. 16,640
Int. Cl. E21b 33/12
U.S. Cl. 166—187 13 Claims



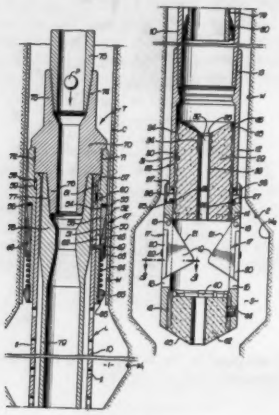
A permanently set inflatable element is adapted to be supported on tubular support means and is provided with valve means for conducting fluid from the interior to the exterior of the tubular means and into the inflatable element for inflation and permanent deformation thereof.

3,581,817
TENSIONED WELL BORE LINER AND TOOL
Archer W. Kammerer, Jr., Fullerton, Calif., assignor to Baker Oil Tools, Inc., City of Commerce, Calif.
Filed Mar. 13, 1969, Ser. No. 806,852
Int. Cl. E21b 43/10
U.S. Cl. 166—208 18 Claims

A well bore liner apparatus and a running tool, the liner apparatus having expansible anchor members at its lower end expansible into an underreamed section of the well bore to anchor the liner against upward movement, the liner also having upper anchor elements engageable in a previously set well casing, the tool being employed to tension the liner body between the lower and upper anchors. Such a construction in which the running tool is releasable from the liner before cementing of the lower anchor in the enlarged bore hole section.

It is sometimes desirable to set perforated or slotted liners in well bores which traverse unconsolidated oil producing formations. In some instances, gravel is packed outside the liner to fill the annular space. On occasions, it may be desira-

ble to apply heat to the formation or to the gravel pack by the injection of steam into the well, such heat tending to expand the usual liners and causing problems, such as release of the liner hanger.

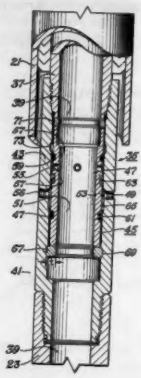


3,581,818
FLOW CONTROL APPARATUS
Myron M. Kinley, 103 Maple Lane, Chickasha, Okla.
Filed Nov. 7, 1969, Ser. No. 874,780
Int. Cl. F21b *33/00*
U.S. Cl. 166—224 **10 Claims**

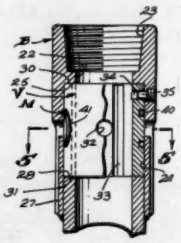
Flow control apparatus including a valve, choke or other flow control element adapted to be seated and unseated in a well pipe, wherein means are provided for moving the flow control element longitudinally into position adjacent to but out of sealing contact with a port in the well pipe to be closed, and thereafter laterally into sealing contact with the well pipe around the port.

3,581,819
PRESSURE EQUALIZING APPARATUS
Jack W. Tamplen, R.R. 2, Celina, Tex.
Filed Mar. 26, 1970, Ser. No. 22,881
Int. Cl. E21b *33/00*
U.S. Cl. 166—224 **29 Claims**

Pressure equalizing apparatus characterized by a pressure equalizing device for being left in the well and removable and insertable shifting prong assembly for operating the pressure equalizing device without removing it from the well; the apparatus being adapted to allow any damage done by high differential pressures to be done to seals on the removable shifting prong assembly and prevent any damage to seals on the pressure equalizing device. Specific individual structures are also disclosed.



3,581,820
PORT COLLAR
Erwin Burns, c/o Burns Tool Co., 8346 Salt Lake Ave., Bell, Calif.
Filed May 29, 1969, Ser. No. 829,042
Int. Cl. E21b *33/10;* **F16k** *5/18*
U.S. Cl. 166—226 **8 Claims**

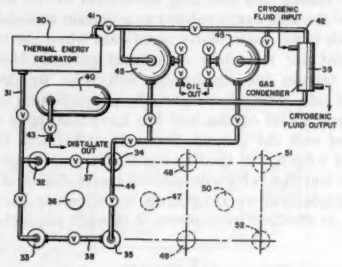


A port collar having a tubular body with a lateral outer port, a valve sleeve rotatable within the body and having a blind side normally overlying the outer port, and an inner port normally spaced circumferentially from the outer port and shiftable into and out of register therewith and sealing means including an O-ring groove in the blind side of the sleeve normally occurring in spaced relationship about the outer port and an O-ring seal in the groove and sealing with and between the sleeve and the body.

3,581,821
CRYO-THERMAL PROCESS FOR THE RECOVERY OF OIL
Sigmund L. Ross, Bronx, N.Y., assignor to Petra-Flow Inc., New York, N.Y.
Filed May 9, 1969, Ser. No. 823,306
Int. Cl. E21b *43/24, 43/25*
U.S. Cl. 166—245 **14 Claims**

A process for the recovery of oil, particularly the secondary recovery of oil is disclosed. The process is based on a series of steps involving the use of cryogenic fluids and the application of high thermal energy to a complex of elongated holes drilled in an oil production formation. Major steps include: establishing a complex of elongated holes arranged in

a predetermined geometric pattern which penetrate the oil production formation; injecting pressurized, superheated



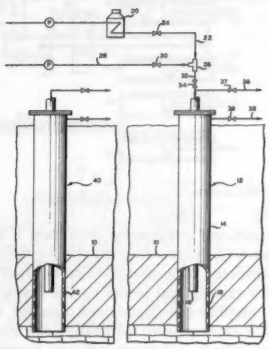
steam into the holes; fracturing the oil production formation using cryogenic techniques; and recovering the mobilized oil.

3,581,822

METHOD OF PREVENTING CASING AND/OR TUBING DAMAGE IN STEAM INJECTION WELL

Archie J. Cornelius, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 30, 1968, Ser. No. 787,669
Int. Cl. E21b *43/24*
U.S. Cl. 166—263 **12 Claims**



Oil is produced from an underground oil-yielding stratum by injecting through a well into said stratum a stream of hot injection fluid obtained by mixing steam and water at the surface of the earth prior to introduction into said well. The water reduces the temperature of the steam to a valve which is not detrimental to the well casing and/or tubing. In one embodiment, the well may be used in a "huff and puff" process and then as an injection well in a direct drive process.

3,581,823

RECOVERY OF HYDROCARBONS FROM SUBTERRANEAN HYDROCARBON-BEARING FORMATIONS

David G. Feuerbacher, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed June 24, 1969, Ser. No. 836,160
Int. Cl. E21b *43/22*; **C10g** *1/00*
U.S. Cl. 166—267 **17 Claims**

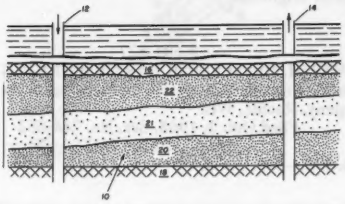
A process for the recovery of hydrocarbons from subterranean hydrocarbon-bearing formations by the treatment of the formation with an aqueous medium containing an alkali metal hydroxide and a low molecular weight amine.

3,581,824

OIL RECOVERY PROCESS USING AN IONIC POLYSACCHARIDE THICKENING AGENT

Billy G. Hurd, Dallas, Tex., assignor to Mobil Oil Corporation

Filed Dec. 17, 1969, Ser. No. 885,793
Int. Cl. E21b *43/22*
U.S. Cl. 166—270 **14 Claims**



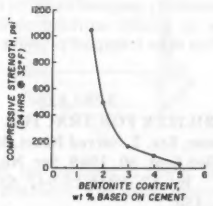
This specification discloses an oil recovery process involving the injection of an aqueous liquid containing an ionic polysaccharide thickening agent which is subject to agglomeration in the presence of divalent cations. This liquid, which exhibits a relatively low divalent cation concentration, is preceded by an aqueous liquid having a relatively high divalent cation concentration. As the first injected liquid moves through the reservoir, divalent cations are adsorbed onto the reservoir surfaces. These cations then are desorbed from the reservoir surfaces into the liquid containing the thickening agent in order to cause agglomeration thereof. This agglomeration results in partial plugging of the reservoir preferentially within the more permeable zones thereof in order to improve the sweep efficiency of the recovery process.

3,581,825

PERMAFROST CEMENTING PROCESS

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation

Filed Dec. 9, 1969, Ser. No. 883,499
Int. Cl. E21b *33/14*
U.S. Cl. 166—288 **13 Claims**



This specification discloses methods of treating wells drilled into the earth. These methods are particularly applicable for cementing behind casing located in wells drilled through permafrost zones. In carrying out these methods, slurries of calcium aluminate cement, clays selected from the group of bentonite, attapulgite and mixtures thereof, and water are formed and placed in the wells to be treated:

3,581,826

PROCESS FOR EXTINGUISHING FIRES BY DISPENSING RIGID POLYMER FOAM FORMING MIXTURES

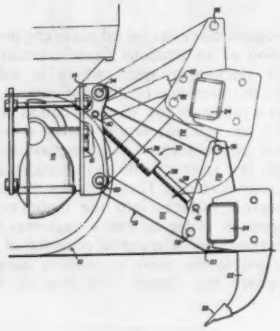
Thomas P. Dougan, Corona Del Mar, and Samuel Chess, San Pedro, both of, Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 10, 1968, Ser. No. 782,767
Int. Cl. A62c *1/12*
U.S. Cl. 169—15 **7 Claims**

A process for extinguishing fires burning on the surface of combustible liquids is disclosed. A thermally resistant rigid

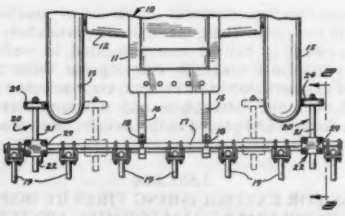
polymer foam forming reaction mixture is dispensed directly on to the burning liquid surface so as to form a continuous solid layer over the entire surface of the combustible liquid. At the time at which it reaches the foam surface the foam reaction mixture is in a state of reaction beyond the start of foam rise but prior to gelation. In addition to extinguishing the fire the polymer foam layer serves as a floating protective blanket over the combustible liquid, preventing contamination and/or reignition.

3,581,827
CONTROL DEVICE FOR EARTH WORKING TOOL
Michael D. Ratcliff, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.
Filed Oct. 3, 1968, Ser. No. 764,852
Int. Cl. B66f *11/02*
U.S. Cl. 172—307 **1 Claim**



A tractor having an earth working tool, such as a ripper, attached to the rear end thereof by linkage means and raised and lowered with respect to the tractor by power means. The power means include fluid rams disposed in vertical alignment with upper and lower links so that the links at all times protect the ram from destructive forces. The upper link is longer than the lower link so that the shank of the ripper is disposed substantially perpendicular to the transverse axis of the vehicle in its ground working position but is angularly disposed thereto in its transport position.

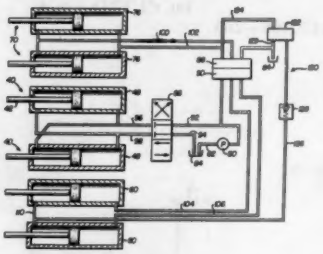
3,581,828
STABILIZER FOR TRACTOR TOOL BAR
Gerald E. Thune, Rte. 2, Sacred Heart, Minn.
Filed Sept. 30, 1969, Ser. No. 862,359
Int. Cl. A01b *59/042, 63/116*
U.S. Cl. 172—450 **3 Claims**



A stabilizer for a tool bar hitched in draft relation to a tractor comprising a support mounted on the tool bar and extending forwardly therefrom alongside a rear wheel tire of the tractor, and a rotary element journaled for rotation on the forward end of the support to bear against and roll along side of the tractor tire to prevent lateral movement of the tool bar.

Tool bars carrying ground breaking, planter implements or the like are generally mounted at the rear end of a two or three point hitch carried by a draft tractor. Such hitches are pivoted at their forward ends to the tractor on horizontal axes for raising and lowering movement of the tool bar. So mounted the tool bar is subject to a certain amount of lateral play. This is not particularly significant when the tractor and implement are travelling over level ground. However, on sidehill terrain the implement will tend to drift to the downhill side. This can be partially prevented by mounting a colter-type wheel on the tool bar for penetrating rolling engagement with the ground. However, it is found that such a wheel or wheels will tend to depart from a straight path behind the tractive vehicle in sidehill travel due to the laterally sliding implement weight making it difficult to carry the tool bar and its attached implements in straight parallel rows.

3,581,829
HYDRAULIC CONTROL FOR EARTH MOVING IMPLEMENT
Claude M. Frisbee, and Carl O. Pedersen, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.
Filed Oct. 17, 1968, Ser. No. 768,435
Int. Cl. E02f *3/76*
U.S. Cl. 172—804 **1 Claim**

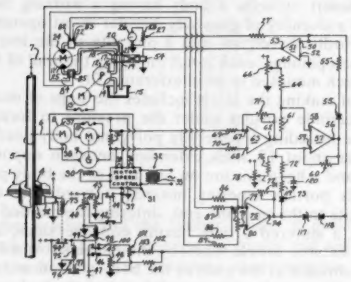


An earth moving implement including a blade adjustably supported on a U-shaped frame with the free ends of its legs pivotally connected to a vehicle. The control system includes fluid rams for raising and lowering the frame with respect to the vehicle, angling the blade with respect to the U-shaped frame about a vertical axis, and tilting the blade with respect to the frame about a horizontal axis longitudinally of the vehicle. The hydraulic control incorporates an interconnection between the rod ends of the tilt cylinders with means for supplying a constant charging pressure to the rod ends of the tilt cylinders. The charging means may include a connection from the angle cylinders through a regulator valve to the rod ends of the tilt cylinders; or a connection between one end of the lift cylinders through a regulator valve to the rod end of the tilt cylinder; or a connection between the conventional pump of the transmission hydraulic system of the vehicle, or a separate pump connected to the rod ends of the tilt cylinder, all alternates.

3,581,830
LINEAR FEED CONTROL FOR A ROTARY TOOL
Thomas A. Stoner, Brookfield, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.
Filed Sept. 3, 1969, Ser. No. 854,871
Int. Cl. E21b *3/02*
U.S. Cl. 173—6 **11 Claims**

A blast hole drill has a rotary drive motor, linear drive motor, vibration sensor and control system. The DC rotary drive motor has a Ward-Leonard drive responsive to a speed control potentiometer and a reduced speed control triggered by the vibration sensor. The hydraulic linear drive motor is controlled by a directional and flow control valve responsive to summed tachometer and reference signals with a reduced

speed control triggered by the vibration sensor. The control system balances rotary torque and downfeed force to reduce



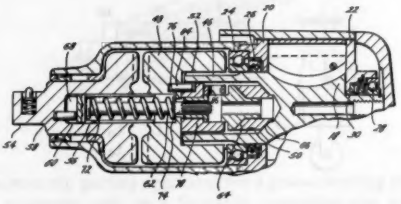
downfeed speed when torque feedback exceeds a predetermined value relative to downfeed feedback.

3,581,831

ROTARY IMPACT TOOL

Paul A. Biek, Houston, Tex., assignor to Dresser Industries, Inc., Houston, Tex.

Filed June 18, 1969, Ser. No. 834,278
Int. Cl. B25d *15/02*
U.S. Cl. 173—93.6 **11 Claims**



A rotary impact tool having a fluid-operated motor having a rotor with a tubular extension to which a hammer is slidably mounted, an anvil normally spaced axially from the hammer, drive means including clutch means for rotating the anvil with rotation of the rotor and a cam means to cam the hammer axially into engagement with the anvil and with both the cam and clutch means being substantially wholly positioned within the recess of the tubular extension of the rotor.

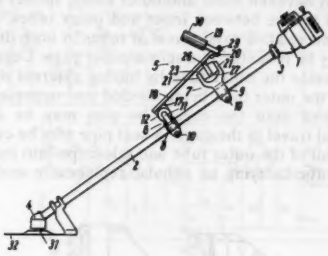
3,581,832

FREE-CUTTING DEVICE

Richard Heermann, Hebsack; Anton Wehle, Stuttgart-Westphalia, and Andreas Stihl, Neustadt, all of, Germany, assignors to Andreas Stihl Maschinenfabrik, Neustadt, Germany

Filed June 2, 1969, Ser. No. 829,676
Claims priority, application Germany, June 1, 1968, ST 22 679
Int. Cl. E21c *1/00*; **B23d** *49/00*; **B27b** *9/00*
U.S. Cl. 173—162 **27 Claims**

A free-cutting device with an internal combustion engine drivingly connected through a pipe surrounded shaft with a free-cutting tool adapted to be moved over the ground, said pipe being provided with handle means for guiding the device



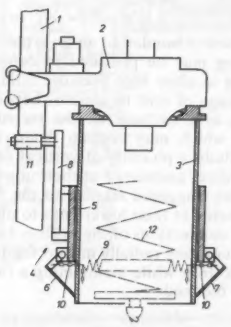
while said handle means is connected to the device through at least one vibration-damping bearing.

3,581,833

WIPER ASSEMBLY FOR CLEANING SPIRAL TWIST BITS ON EARTH DRILLING RIGS

Rudolf R. G. Hennecke, and Kraus Egon Buoch-Grunbach, both of Esslingen/Neckar, Germany, assignors to Delmag-Maschinenfabrik Reinhold Dornfeld, Esslingen/Neckar, Germany

Filed Feb. 20, 1970, Ser. No. 012,911
Claims priority, application Germany, Feb. 28, 1969, P 19 10 367.8
Int. Cl. E21b *33/03*
U.S. Cl. 175—84 **12 Claims**



A wiper assembly for cleaning a spiral twist bit on an earth-drilling rig is disclosed. The wiper assembly comprises a first cylindrical tube member mounted on the drilling table of a drill rig. The first tube is mounted concentrically with the drill. A second cylindrical member is mounted concentrically with the first tube and carries, on diametrically opposite portions, pivotally mounted wiper blades. In a first position of the wiper blades, they engage the outer wall of the first tube and are clear of the bore. Each wiper blade is resiliently urged radially inwards and, when the second cylindrical member is displaced towards the lower end of the first tube, the wiper blades pivot inwards and engage the spiral twist bit of the drill. Thus, when the drill is rotated and retracted, it is cleaned by the wiper blades.

3,581,834

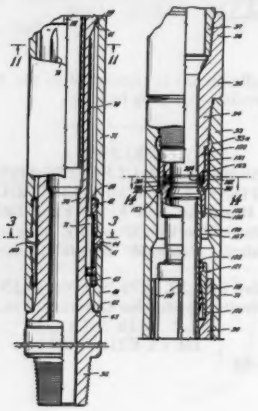
TELESCOPIC DRILL STRING UNIT

Jackson M. Kellner, and William R. Garrett, both of Midland, Tex., assignors to Smith International, Inc., Midland, Tex.

Filed July 17, 1969, Ser. No. 842,672
Int. Cl. E21b *17/00*
U.S. Cl. 175—321 **68 Claims**

Telescopic drill string unit including outer tube and inner tube axially slidable within outer tube, connections at upper

end of outer tube and lower end of inner tube for making connection with other drill string members to transmit fluid and force, bearing means to transmit lateral forces and bending moment between inner and outer tubes, splines and slots to transmit torque between inner and outer tubes, shoulder stops to limit relative axial travel of tubes in both directions. Splines may be mounted in a split annular cage. Cage may be mounted inside the outer tube by having external threads at both ends, the outer tube being divided into upper and lower parts screwed onto the cage. The pins may be anchored against axial travel in the cage. A seal pipe may be connected to upper end of the outer tube and telescope into inner tube, the inner tube carrying an annular replaceable seal unit in-

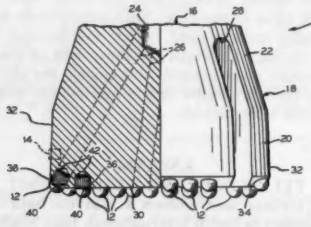


cluding a rubber sleeve bonded to an inverted fusiform metal ring. A choke ring may be provided in connection of seal pipe to outer tube to allow high pressure fluid to bleed from through flow passage of unit to annulus between inner tube and outer tube so as to exclude the low pressure fluid that is outside the unit which may contain deleterious materials. The ring may include a plurality of vertical orifices with adjacent pairs of orifices connected at their upper ends and adjacent orifice pairs staggered relative to the first mentioned pairs being connected at their lower ends to place the orifices in series, the end connections of the orifices being larger than the orifices and requiring radially inward fluid travel, thereby to effect pressure drop while maintaining a flow passage too large to be easily blocked.

3,581,835
INSERT FOR DRILL BIT AND MANUFACTURE THEREOF

Frank E. Stebley, 3815 Nemesis, Gurnee, Ill.

Filed May 8, 1969, Ser. No. 822,883
Int. Cl. E21c *13/00*
U.S. Cl. 175—409 **9 Claims**



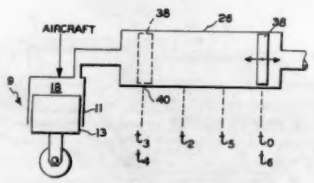
A solid wear-resistant sintered metallic carbide insert adapted for forcible insertion into an opening in a working face of a drill bit includes a generally polygonal body portion having at least about 12 sides extending between opposite ends thereof, and a heat portion on one end of the body portion, the corners formed by the said sides being abraded at the ends of the body portion and tapering inwardly towards the end of the body portion opposite to the said one end thereof, the body portion being insertable into the working face opening for mounting the body portion therein with the head portion exposed at the working face. A drill bit incorporating the insert includes a body having a working face provided with a plurality of generally circular insert openings extending inwardly therefrom, and a plurality of the inserts mounted in the openings, each insert engaging the wall of the opening in which mounted in an interference fit.

A method of making the insert includes the steps of molding metallic carbide powder under die pressure to form a molded article including a generally polygonal body portion having at least about 12 sides extending between opposite ends thereof and a head portion on one end of the body portion, the body portion tapering inwardly towards the end thereof opposite to the said one end, sintering the molded article to form a sintered article having concave sides, and abrading the sintered article whereby the corners formed by the sides are abraded at the ends of the body portion and are tapered inwardly towards said opposite end of the body portion, thereby producing an insert having the body portion insertable into the working face opening for mounting the body portion therein with the head portion exposed at the working face.

3,581,836
METHOD FOR REDUCING FRICTIONAL ERRORS IN DETERMINING THE WEIGHT OF AN OBJECT SUPPORTED BY A PNEUMATIC OR HYDRAULIC DEVICE

Roy R. Segerdahl, Bellmore and Sandford I. Greene, Massapequa, N.Y., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 2, 1969, Ser. No. 881,353
Int. Cl. G01g *19/02*
U.S. Cl. 177—1 **4 Claims**



A device supporting an object has its internal pressure successively increased and decreased to determine the change in pressure experienced between the steady-state pressure required to raise the object and that required to merely support the object. The lower steady-state pressure plus one-half the difference in pressure between the higher and lower steady-state pressures is then representative of the actual weight supported by the device.

ERRATUM

For Class 180—55 see:
Patent No. 3,581,682

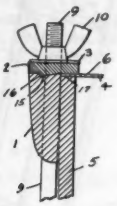
3,581,837
BATTERY CLAMPING LUGS

John H. Bauschard, 316 E. 28th St., Erie, Pa.

Filed Apr. 22, 1969, Ser. No. 818,344
Int. Cl. B62d *25/00*
U.S. Cl. 180—68.5 **1 Claim**

A battery retention system which is intended to support a conventional type of automobile battery in its rack in an automobile or truck. The retention system is made up of spaced lugs integrally attached to two opposite sides or ends by the

battery case. A holddown rod is attached to each of two opposite sides of the battery rack. The lugs are spaced apart just enough to freely receive the bolts between them. Each lug has an indentation, and a rubber washer is received on each bolt. A metal washer is supported on the top of the



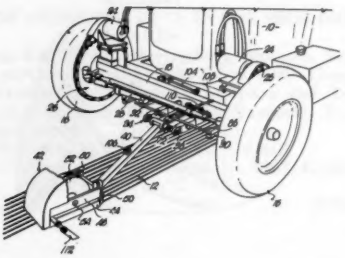
rubber washer and the rubber washer is deformed into the notch in the lugs so that the holddown rod will not slip relative to the case. The insulation characteristics of the rubber prevents leakage of electrical current from the battery to the battery case.

3,581,838

VEHICLE GUIDING APPARATUS

Harry W. Rhodes, Belton, Mo., assignor to Norton Company, Worcester, Mass.

Filed Jan. 15, 1969, Ser. No. 791,311
Int. Cl. B62d *1/26*
U.S. Cl. 180—79 **13 Claims**



Automatic guiding apparatus for a groove-cutting machine has a sensing unit on a forwardly extending arm which is swingable vertically to not only remove the feelers of the sensing unit from the grooves, but to disengage certain parts of the apparatus from the steering mechanism. Automatic steering takes place upon relative movement vertically and laterally of two components of the sensing unit.

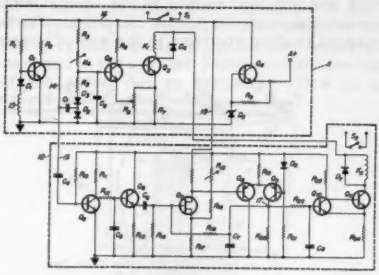
3,581,839

EXHAUST POLLUTION CONTROL CIRCUIT

Ralph Wolf Carp, Baltimore, Md., assignor to The Bendix Corporation

Filed Jan. 10, 1969, Ser. No. 792,204
Int. Cl. B60k *13/00*
U.S. Cl. 180—82 **2 Claims**

The invention relates to a circuit for actuating an output load when an input signal above a predetermined level is present. In a particular embodiment the output load is a coil which actuates a linkage to prevent the accelerator pedal of a vehicle from fully closing when it is released by the driver while the vehicle is traveling above a predetermined speed. The input signal is a varying voltage, the frequency of which is representative of the vehicle speed. By so controlling the closing of the accelerator pedal, the expulsion of unburned fumes and gas is minimized. An acceleration responsive circuit is also included. This circuit is actuated when an acceleration above a predetermined rate is reached to prevent



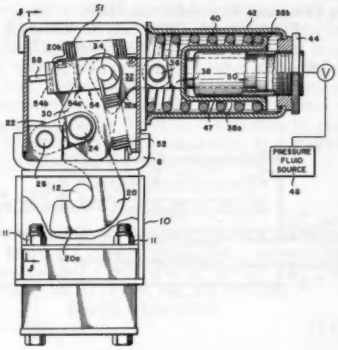
an attempt at accelerating the vehicle at a rate beyond its capabilities.

3,581,840

HYDRAULICALLY OPERABLE LOCKING MECHANISM FOR TILT CAB VEHICLES

Charles M. Hirst, Jr., and Eugene C. Lipshield, both of Moberly, Mo., assignors to Orscheln Brake Lever Mfg. Company, Moberly, Mo.

Filed Oct. 10, 1969, Ser. No. 865,394
Int. Cl. B62d *27/00*
U.S. Cl. 180—89 **10 Claims**



Improved hydraulically operable means for locking together the sections of a tilt cab vehicle, characterized by the provision of a jam-responsive means preventing movement of the locking mechanism to the completely locked condition when the cab section is twisted or cocked slightly from the fully seated position relative to the chassis frame. In the preferred embodiment, in addition to the known link means and bellcrank cam means for operating a hook member between fully locked, safety and fully released positions relative to a fixed pin member, a clevis member is provided that is operable when the tilt cab section is improperly oriented relative to the chassis frame for preventing erroneous movement of the spring-biased bellcrank cam means to the fully locked condition.

3,581,841

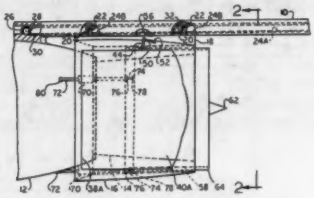
THRUST REVERSING AND NOISE SUPPRESSING APPARATUS FOR A JET ENGINE

Burt F. Raynes, Chula Vista, Calif., assignor to Rohr Corporation

Filed July 27, 1970, Ser. No. 58,301
Int. Cl. B64d *33/06;* **F01n** *1/14*
U.S. Cl. 181—33Hc **10 Claims**

Tubular ejectors are arranged so that in a retracted position they are concentrically disposed around a thrust nozzle

projecting from aircraft jet engine nacelle and in a deployed sound-suppressing and thrust-augmenting position they are disposed downstream from the nozzle in coaxial relation therewith and telescope relative to one another with the largest ejector spaced farthest from the nozzle. Blocker doors are arranged to close apertures in the wall of largest ejector



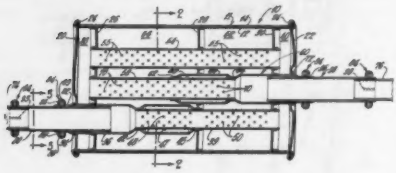
or to extend transverse to the apertures and deflect engine jet stream forwardly therethrough to thereby reverse the thrust of the downstream. At takeoff ejectors are deployed to augment thrust and blocker doors are closed. If takeoff must be aborted, blocker doors can be deployed to reverse thrust. During landing only the largest ejector is deployed downstream from nozzle and the blocker doors are deployed.

3,581,842

EXHAUST MUFFLER AND METHOD OF AND ADAPTER MEANS FOR MOUNTING SAME

James R. Hall, Toledo, Ohio, assignor to Oldberg Manufacturing Company, Grand Haven, Mich.

Filed Jan. 31, 1969, Ser. No. 795,422
Int. Cl. F01n *7/18;* **F16l** *21/00, 27/12*
U.S. Cl. 181—72 **17 Claims**



The disclosure embraces a muffler construction for use with the exhaust gas conveying system of an internal combustion engine of an automotive vehicle, the muffler construction embodying adapter mounting means telescopingly associated with the muffler construction, and a method facilitating installation of a replacement muffler construction through connection of the adapter means with existing gas passage means such as the exhaust pipe and a tail pipe.

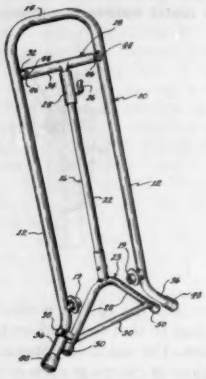
3,581,843

AIRCRAFT TOW BAR

James E. Hadley, Wichita, Kans., assignor to Miro-Flex Company, Inc.

Filed July 8, 1969, Ser. No. 839,884
Int. Cl. B60d *1/00, 3/00;* **F06f** *1/00*
U.S. Cl. 182—20 **23 Claims**

An aircraft tow bar of light weight, tubular material which includes a fork member adapted to be engaged with a part of an aircraft landing gear, and a draft handle pivotally joined to the fork member by a transverse bar which is near the bight of the fork member so the handle may be extended for towing or folded alongside the fork for storage. The dimensions of the fork member and draft handle are such that when folded their respective free ends are in juxtaposition for compact storage; or when positioned at an acute angle to one another their free ends may be placed upon the ground to provide a stable ladder in which the transverse pivot bar



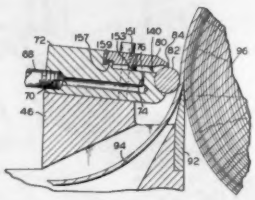
serves as a step which may be readily mounted by a person standing on the ground.

3,581,844

VENEER LATHE OILER

Terry A. Carlton, 1216 S. 6th St., Cottage Grove, Oreg.

Filed Mar. 28, 1969, Ser. No. 811,370
Int. Cl. B27l *5/00;* **F16n** *7/36*
U.S. Cl. 184—6.14 **15 Claims**



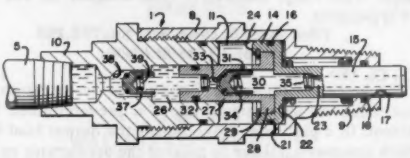
A double-acting pneumatic cylinder drives pistons of two oil pump cylinders to supply high pressure lubricant through injection manifolds and restrictive orifices and a roller bar chamber to a veneer lathe roller bar to lubricate and clean the roller bar under high pressure.

3,581,845

AIR LINE OILER

Gerrit Van Nederynen, Sayre, Pa., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Mar. 7, 1969, Ser. No. 805,134
Int. Cl. F16n *25/02*
U.S. Cl. 184—7D **6 Claims**



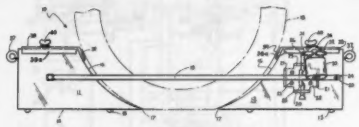
An air line oiler for injecting a slug of oil into an air line at the end of each pressure cycle and including a body containing air and oil ports, a combined piston and plunger and an oil chamber housing the plunger. At the start of the application of air pressure, the plunger draws oil into the chamber

and thereafter pumps the oil into the air line when the air pressure is released.

3,581,846
SAFETY LOCKING BLOCK DEVICE FOR WHEELED VEHICLES

Julian A. Janus, 926 Brooklyn Ave., Brooklyn, N.Y.

Filed Aug. 20, 1969, Ser. No. 851,533
Int. Cl. B60f *3/00*
U.S. Cl. 188—32 **4 Claims**

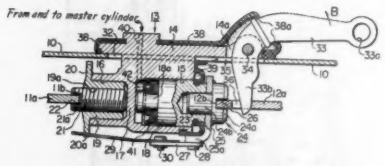


A pair of blocks shaped as chocks to fit under the forward and rearward portions of a vehicle wheel are joined together by a tie bar having one end secured to one block and having its other end slidingly received in ears projecting from a locking plate secured to the other block. A locking pin bearing a cam can be turned to force the cam against the bar. The pin handle is in the form of a loop and an eye is secured in the block adjacent the handle so that the pin may be secured in locked position by a padlock through handle and eye. Each block also has another projecting eye and a chain passed through the latter eyes and around the wheel can be locked by the padlock to prevent theft of the vehicle.

3,581,847
AUTOMATIC ADJUSTING DEVICES FOR SHOE DRUM BRAKES

Tatsumi Torii, Kariya-shi, and Masakazu Ishikawa, Toyota-shi, both of, Japan, assignors to Aisin Seiki Company Limited, Asahi-machi, Kariya-shi, Aichi-ken and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-machi, Toyota-shi, Aichi-ken, Japan

Filed Apr. 29, 1968, Ser. No. 724,815
Claims priority, application Japan, Apr. 30, 1967, 42/36508
Int. Cl. F16d *51/52, 65/56*
U.S. Cl. 188—79.5 **9 Claims**



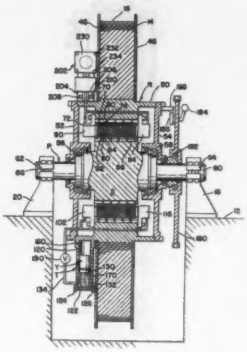
An automatic adjuster for a shoe drum brake which is provided with a hydraulic shoe expander, having a hydraulic piston mechanically connected with one of said shoes and a movable cylinder connected through a variable length transmission means to the remaining one of said shoes, the length of said transmission means being adjustable through a mechanical adder adapted for adding the working movements of said cylinder and said piston.

3,581,848
AIRCRAFT ARRESTING DEVICE WITH CENTRIFUGAL BRAKE

Robert W. Cruger, Springfield, Pa., and Robert L. Bair, Canton, Ohio, assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Dec. 19, 1968, Ser. No. 785,205
Int. Cl. B60t *11/10*
U.S. Cl. 188—187 **9 Claims**

An aircraft-arresting device includes a tape reel and a brake for retarding rotation of the reel. The brake includes a rotor and a stator having cooperating braking means thereon. A centrifugally operated brake actuating means is mounted on the rotor for rotation therewith to engage the braking means with a force proportional to the square of the reel velocity. The centrifugally operated brake-actuating means may include a cylinder mounted on the reel and a piston shiftably mounted in the cylinder. Rotation of the reel causes shifting of the piston due to centrifugal force to apply

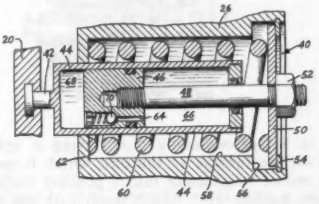


hydraulic pressure to hydraulic brake cylinders with a force which is proportional to the square of the reel velocity. The braking device may include a static brake-applying means for engaging the braking means when the rotor is at rest in order to hold a tape under tension. The static brake-applying means is responsive to rotation of the reel to move to a brake-disengaging position. Locking means may be provided for holding the static brake-applying means in a brake-disengaging position once the reel begins to rotate.

3,581,849
AUTOMATIC BRAKE ADJUSTER MECHANISM

Richard E. Landgraf, South Bend, Ind., assignor to The Bendix Corporation

Filed Oct. 17, 1969, Ser. No. 867,202
Int. Cl. F16d *65/74*
U.S. Cl. 188—196 **11 Claims**

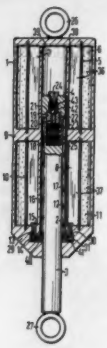


An automatic brake-adjuster mechanism for use with an aircraft disc brake wherein a self-contained sealed hydraulic device is utilized to determine the released position of the pressure plate. The device includes a cylinder which is connected to the pressure plate and functions as a positioning member, and a piston located within the cylinder which is part of and functions as a follower member having a limited amount of movement. The cylinder contains a constant volume of incompressible fluid which is permitted to flow from one side of the piston to the other side thereof, by a check valve located in the piston, when the cylinder moves relative to the piston.

3,581,850
VALVE FOR SHOCK ABSORBERS

Horst Jaitl, Schweinfurt Am Main, Germany, assignor to Fichtel and Sachs AG, Schweinfurt am main, Germany

Filed Mar. 14, 1969, Ser. No. 807,342
Claims priority, application Germany, Mar. 21, 1968, P 17 50 021.9
Int. Cl. F16f 9/34
U.S. Cl. 188—322 9 Claims

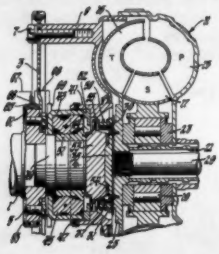


The noise resulting from the opening and closing of a check valve in a shock absorber, hydropneumatic spring, or similar suspension element is eliminated or sharply reduced by the insertion of a porous plug into a duct leading to the movable valve member or to the valve seat.

3,581,851
TORQUE TRANSMITTING FLUID UNIT WITH POSITIVE LOCK-UP CLUTCH

Thomas W. Hall, II, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1969, Ser. No. 823,885
Int. Cl. F16d 47/06
U.S. Cl. 192—3.31 8 Claims



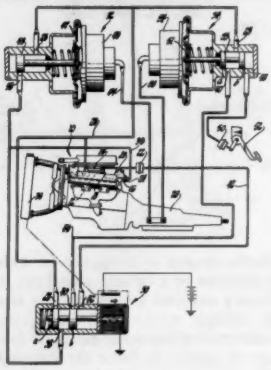
There is a hydrodynamic unit having a splined sleeve mounted on the turbine of the unit which is movable by a magnetic motor mechanism into a positive locking position with a core having teeth which mesh with the teeth of the sleeve to lock up the unit. When the core is deenergized a spring mechanism moves the sleeve to its unlocking position thereby allowing the unit to function in a conventional manner. Controls are provided to have the unit lock up under predetermined conditions such as in steady state driving at low engine speeds.

3,581,852
ENGINE AND PARKING BRAKE CONTROLLED BY TRANSMISSION RATIO AND ENGINE TEMPERATURE

Thomas J. Griffen, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1969, Ser. No. 867,180
Int. Cl. F16h 57/10
U.S. Cl. 192—4 2 Claims

A vacuum control system having hydraulic- and temperature-actuated control valves. The control valves direct vacuum signals from the engine inlet manifold to the ignition distributor, the idle speed control and the vehicle-parking brake under specific conditions. The control valves are operated automatically such that when the vehicle transmission is in high gear normal ignition spark advance will occur, when the transmission is conditioned for other than high gear

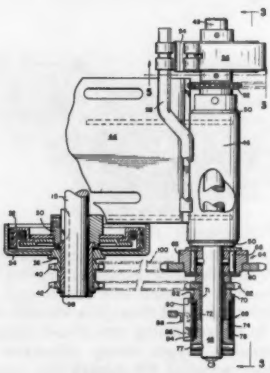


and the engine temperature is above a predetermined value normal ignition spark advance will occur, when the transmission is shifted from neutral or park to forward or reverse drive the parking brake will be released, and when the transmission is in neutral or park and the engine temperature is above the predetermined temperature, the engine idle speed will be increased.

3,581,853
TWO-SPEED MOTOR-BIKE DRIVE

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed Apr. 21, 1969, Ser. No. 817,661
Int. Cl. F16h 57/10; F16d 67/02
U.S. Cl. 192—4 6 Claims

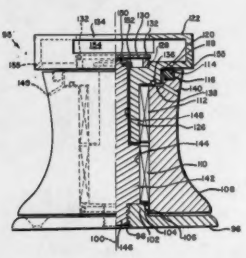


A two-speed chain transmission for minibikes, as original equipment or as a conversion kit. High- and low-speed sprockets on a jackshaft are chain driven at different speeds by high and low drive sprockets carried by a centrifugal clutch on the engine shaft. The jackshaft is chain connected to the rear wheel of the bike. The low speed driven sprocket is mounted on the jackshaft by an overrunning clutch which permits the jackshaft to overrun the low drive when it is driven by the high drive. The high-speed sprocket is mounted on the jackshaft by a clutch which is disengageable to let the low-speed drive takeover. A brake acts on the jackshaft on the driven side of the clutches.

3,581,854
TORQUE AND BACKSTOP DEVICE FOR WINCHES

Irving R. Versoy, Scituate, Mass., assignor to Walter J. Kreske, Newton Centre, Mass., a part interest

Filed July 24, 1968, Ser. No. 747,398
Int. Cl. F16d 67/02, 41/07; B66d 1/30
U.S. Cl. 192—12 13 Claims

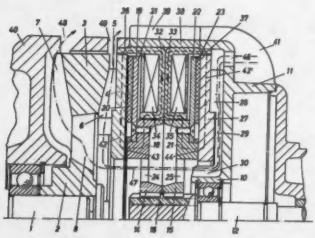


Positive backstop-type silent infinitely variable reciprocating-to-unidirectional motion converter in the form of improved winch embodiments, each having a winch drum constrained to rotate in a single direction with respect to a winch spindle on which it is mounted, the constraint being achieved by a silent positive backstop action of a first roller, sprag or spring clutch engaging the drum and spindle, each winch also including a lever-receiving winch top structure mounted to rotate on the spindle and constrained by silent positive backstop action of a second roller, sprag or spring clutch engaging the top structure and winch drum to rotate with respect to the winch drum only in the opposite direction of the winch drum rotation.

3,581,855
ELECTROMAGNETIC CLUTCH AND BRAKE

Georg Taeffner, and Rudolf Kling, Darmstadt, Germany, assignors to Quick-Rotan Becker & Notz KG, Darmstadt, Germany

Filed July 10, 1969, Ser. No. 840,803
Claims priority, application Germany, July 19, 1968, P 17 63 696.3
Int. Cl. F16d 67/06
U.S. Cl. 192—18 10 Claims



A clutch assembly for a motor drive including a motor shaft connected to a flywheel and a brake disc disposed in axially spaced relation to the flywheel. A solenoid armature is axially connected to an output shaft, between the flywheel and brake disc, for selectively and frictionally engaging the flywheel or the brake disc to respectively drive or brake the output shafts.

3,581,856
TRANSVERSE ENGAGING, PIVOTED PAWL CLUTCH

Lambert W. Fleckenstein, 4445 N. 135th St., Brookfield, Wis.

Filed May 6, 1969, Ser. No. 822,186
Int. Cl. F16d 11/06
U.S. Cl. 192—28 12 Claims

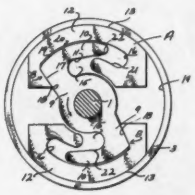
A clutch for coupling a driving member to a driven member. The driving member includes a circular plate having peripheral teeth. The driven member includes a first disc coaxial with the circular plate and having a pivoted pawl for engaging the peripheral teeth to engage the clutch. The pawl is moved into and out of engagement with the peripheral

teeth by a second disc which is relatively movable with respect to the first disc. The second disc contains camming surfaces which coact with the pawl to provide the desired pawl movement during the relative movement of the discs.

3,581,857
ONE-WAY CENTRIFUGAL CLUTCH

Robert J. Dallman, Milwaukee, Wis., assignor to North American Clutch Corp., Milwaukee, Wis.

Filed Sept. 24, 1969, Ser. No. 860,600
Int. Cl. F16d 13/04, 43/24
U.S. Cl. 192—41 8 Claims

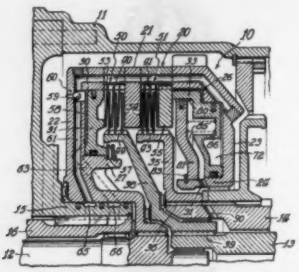


A centrifugal clutch assembly including a drive shaft driven by a reversible motor. The shaft carries a hub having a pair of diametrically opposed driving elements which are located within complimentary recesses in shoes, and the shoes are located within a drum connected to the output member.

When the motor is rotated in one direction, a radial surface of the driving element engages a radial wall of the recess of the corresponding shoe to rotate the shoe, while permitting the shoe to move outwardly by centrifugal force to engage the inner surface of the drum and provide a driving connection between the input shaft and the output member.

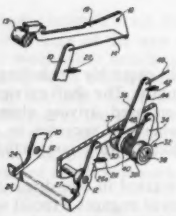
When the motor is operated in the opposite direction, a second surface of the driving element engages a wall of the recess of the corresponding shoe to rotate the shoe, and a locking feature is provided whereby the engagement of the second surface with the recess wall locks the shoe against radial outward movement and provides a freewheeling condition for the output member.

3,581,858
FLUID ACTUATOR
William J. Haley, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Sept. 3, 1968, Ser. No. 756,758
Int. Cl. F16d *25/063, 25/02*
U.S. Cl. 192—106 1 Claim



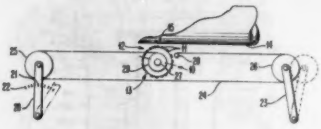
A fluid actuator for a friction device adapted for installation in a transmission mechanism including an annular piston mounted in an annular chamber provided in a rotary housing including passage means to supply fluid to move said piston and including a balance chamber adapted to receive lubricating fluid from the transmission whereby when fluid is exhausted from said passage means to disengage said friction device, centrifugal actuation of the residual fluid in said fluid passage and the actuating-fluid chamber will be balanced by centrifugal actuation of the fluid contained within the balance chamber.

3,581,859
POSITION SENSITIVE MECHANICAL FEEDBACK CONTROL
Arthur R. Johnson, Wethersfield, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Sept. 26, 1968, Ser. No. 762,695
Int. Cl. B41j *23/08*
U.S. Cl. 197—17 2 Claims



A power mechanism having a control member and a power delivery member connected to respective ends of a wrap spring wound around a continuously rotating shaft. The control member is adapted to follow a universal bar and, in response to movement of the universal bar in a predetermined direction, to cause the wrap spring to couple the power delivery member to the continuously rotting shaft until the power delivery member is driven through an angle equal to that traveled by the control member.

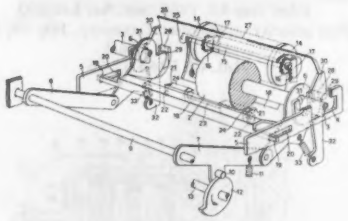
3,581,860
METHOD AND APPARATUS FOR SHIFTING A TYPING ELEMENT
John O'Neill Schaefer, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 30, 1969, Ser. No. 837,849
Int. Cl. B41j *25/24*
U.S. Cl. 197—71 16 Claims



A multicharacter-type element is shifted a relatively long distance between alternate case positions by motion normally employed for selecting individual characters for printing. Case shift movement of the type element is divided into sequential portions that extend in combination through a large amount of the time available in an ordinary character printing operation whereby the dynamics of the system are maintained compatible with the character printing function.

Control of the shift operation is obtained from a novel shift key mechanism that operates like a character key when either depressed or released.

3,581,861
PAPER GUIDE STRUCTURE
Carlo Bellis, Stambino Turin, Italy, assignor to Ing. C. Olivetti & C. S. p. A., Ivrea (Turin), Italy
Filed Sept. 6, 1968, Ser. No. 757,839
Claims priority, application Italy, Sept. 6, 1967, 52931-A/67
Int. Cl. B41j *13/00*
U.S. Cl. 197—127 2 Claims

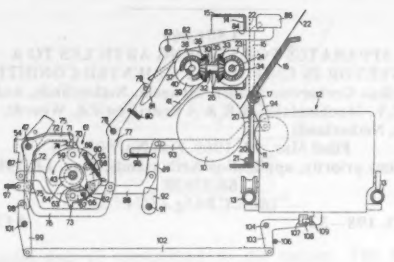


Paper guide structure comprising an arcuate deflector having a window therein and a serrated edge. The deflector is mounted for swinging toward and away from a roller platen. The deflector extends part way around the platen and the window provides access for printing means to contact a paper strip disposed between the deflector and the platen.

3,581,862
DOCUMENT-ALIGNING DEVICE FOR OFFICE MACHINES
Bruno Sandrone, and Antonio Toniolo, both of Ivrea, Torino, Italy, assignors to Ing. C. Olivetti & C., S.p.A.,, Ivrea (Torino) Italy
Filed May 6, 1969, Ser. No. 822,248
Claims priority, application Italy, May 8, 1968, 51572-A/68
Int. Cl. B41j *13/00*
U.S. Cl. 197—127 7 Claims

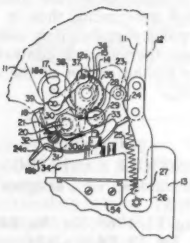
Document-aligning device for office machines, comprising a guide plate for the document, first and second stops for arresting two edges of the document in two directions perpendicular to each other, a rotatable roller which cooperates with the plate to urge the document first against the first

stop, and means for turning the shaft of the roller through 90° when the document is arrested by the first stop as a result



of which the roller then urges the document against the second stop.

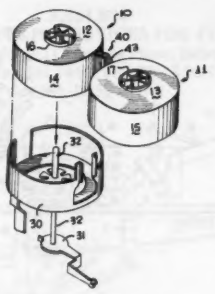
3,581,863
BUSINESS MACHINE PRINTER RIBBON AUTOMATIC INKING DEVICE
Andre F. A. Lottiau, Vilvorde, Belgium, assignor to The National Cash Register Company, Dayton, Ohio
Filed July 31, 1968, Ser. No. 749,200
Claims priority, application Great Britain, Dec. 12, 1967, 56334/67
Int. Cl. B41j *31/14, 27/12*
U.S. Cl. 197—171 **2 Claims**



An ink-metering roll regularly shifted during each cycle of a business machine from an associated ribbon-inking roll to an associated ink supply and thence back to said inking roll for transferring a predetermined amount of ink from such supply to a printing mechanism ribbon associated for advancement with the rotation of said inking roll. In the preferred form, the ink supply is arranged for dispensing a precise amount of ink to several peripheral zones on said metering roll when moved thereagainst, the metering roll is arranged for friction rotation with the inking roll during machine cycling, and the metering roll is longitudinally grooved for distributing the ink so dispensed thereon equally therealong and onto said ribbon-inking roll during the time of rotation thereof.

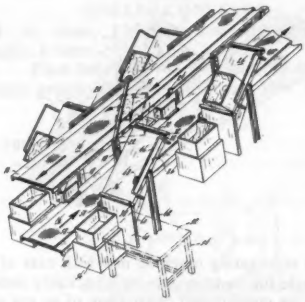
3,581,864
RIBBON LOCK FOR TYPEWRITER SPOOLS
Walter D. Landgraf, 9628 S. Kildare Ave., Oak Lawn, Ill.
Filed Dec. 23, 1968, Ser. No. 785,935
Int. Cl. B41j *35/00, 33/14*
U.S. Cl. 197—175 **1 Claim**

A typewriter ribbon spooling arrangement comprising two spools joined by an open bridging channel through which the ribbon passes, and which can be broken to enable installation of the spools in a typewriter, wherein integral hinged covers



are provided for the channels, which prevent transverse emergence of the ribbon from the channels.

3,581,865
INCLINED TRANSFER STATION
Gordon C. Adams, Auburn, Mass., assignor to Diamond Machinery Company, Lewiston, Maine
Filed Apr. 29, 1970, Ser. No. 32,810
Int. Cl. B23q *5/22*
U.S. Cl. 198—19 **8 Claims**

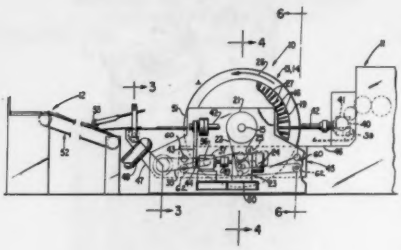


Worktables, particularly an inclined transfer station positioned adjacent a top endless conveyor for diverting tote boxes from the conveyor to a work station area and then returning the boxes via a lower conveyor. The inclined transfer station includes a receiving platform which is parallel to the conveyor and has a stop roller at its bottom edge in between the top and lower conveyors. The stop roller is mounted upon an axis transverse to the conveyors. The receiving platform may include a guard rail on its outer side. The assembly saves work station space and operator time in receiving and returning tote boxes to the conveyors.

3,581,866
TURNOVER DEVICE FOR SHEET MATERIAL
William J. Hottendorf, Los Altos Hills, Calif., assignor to Ametek, Inc., New York, N.Y.
Filed Oct. 27, 1969, Ser. No. 869,834
Int. Cl. B41f *5/02;* **B65g** *29/00, 47/24*
U.S. Cl. 198—25 **12 Claims**

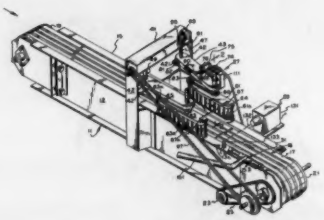
In an apparatus for the printing and scoring of blanks of sheet material for folding into boxes, a turnover device is positioned between the printing and scoring sections. The turnover device comprises a pair of axially spaced discs fixedly mounted upon a rotatable shaft disposed in substantially a horizontal plane. On the inner face of each disc, there is a plurality of equally spaced radially extending ribs with the ribs on the respective discs facing each other. On one side of the shaft, there is positioned a pair of endless belts which move blanks horizontally into positions between the opposed ribs. The discs are rotated in a direction upwardly from these belts to deposit the inverted blanks on a similar pair of

endless belts positioned between the discs on the other side of the rotatable shaft. The belts are perforated and a suction



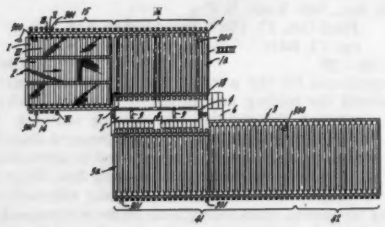
is created through the upper reaches of the belts to retain the blanks thereon.

3,581,867
ARTICLE SEGREGATING MACHINE
William F. Filz, Portland, Oreg., assignor to North Pacific Canners & Packers, Inc., Portland, Oreg.
Filed Apr. 5, 1968, Ser. No. 718,995
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 **10 Claims**



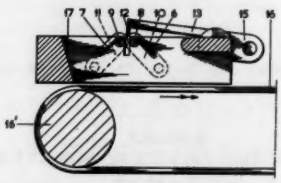
A corn ear segregating machine in which ears of corn are carried in single file fashion against a rockable sensing shoe which senses the end-for-end orientation of an ear of corn at the time the ear intercepts the light beam of a photocell unit, whereby a rejection system is actuated if the ear is traveling butt end first but not actuated if the ear is traveling tassle end first.

3,581,868
CONVEYOR ASSEMBLY
Jack W. French, Lake Forest; Richard M. Lewanski, Chicago, and Richard E. Modry, Oak Park all of, Ill., assignors to Sommer & Maca Glass Machinery Company, Chicago, Ill.
Filed Feb. 14, 1969, Ser. No. 799,165
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 **2 Claims**



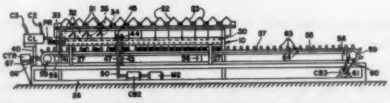
Means for transferring a batch of glass plates from a first to a second conveyor, overturning said plates during transfer, and means for operating portions of said conveyors intermittently to convey said plates at varying speeds in a selected direction, the conveying and overturning mechanisms operating in timed sequence.

3,581,869
APPARATUS FOR FEEDING ARTICLES TO A CONVEYOR IN UNIFORMLY ORIENTED CONDITION
Hendrikus Gerhardus Muller, Hengelo, Netherlands, assignor to N.V. Machinefabriek B & S Bedrijven v.d. Woerdt, Hengelo, Netherlands
Filed Mar. 14, 1969, Ser. No. 807,316
Claims priority, application Netherlands, Mar. 14, 1968, 68.03638
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 **4 Claims**



Articles such as shrimps, having their center of gravity offset to one side, are fed to a moving belt conveyor in uniformly oriented condition by a pair of plates disposed about the conveyor and mounted for vertical swinging movement about their adjacent edges. With the plates both horizontal, the article is positioned on the plates so that it rests on both plates. The plates are then swung downwardly, and the article will slide down the plate that its center of gravity overlies. If it slides down the plate inclined in the direction of conveyor movement, then it retains the same orientation on the conveyor; but if it slides down the oppositely inclined plate, then when it contacts the conveyor it will be flipped over by the action of the conveyor passing under that latter plate.

3,581,870
ARTICLE HANDLING
Howard S. Best, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Aug. 11, 1969, Ser. No. 849,104
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 **6 Claims**

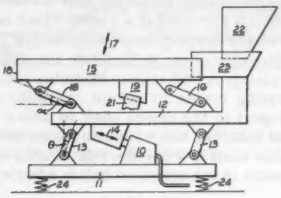


Apparatus for receiving a multitude of similar elongate articles, such as lengths of rod or tubing, from a plurality of conveyors which deliver such articles to an article delivery station, and for longitudinally orienting said articles with corresponding ends thereof in alignment with each other and delivering the articles in their oriented arrangement to a second station for operations to be performed thereon.

3,581,871
VIBRATORY FEEDERS
Arthur Walter Forman, Northwood, Middlesex, England, assignor to Driver Southall Limited, Birmingham, England
Filed Mar. 13, 1969, Ser. No. 806,906
Claims priority, application Great Britain, Mar. 19, 1968, 13152/68
Int. Cl. B65g *27/02, 27/04*
U.S. Cl. 198—37 **20 Claims**

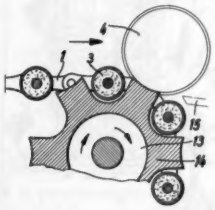
A vibratory feed device having a material carrier mounted on an intermediate mass in a manner which permits deflec-

tion of the carrier relative to the mass in response to the weight of material thereon, said deflection being in a path distinct from vibratory material feed movement applied to



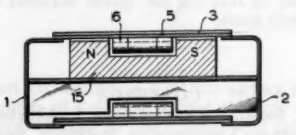
the mass and so transmitted to the carrier. The weight responsive movement is sensed and is used to regulate automatically the rate of flow of material to, on or from the carrier.

3,581,872
MAGNETIC CONVEYOR APPARATUS
Heinrich Grossjohann, Netteberge 67, Bork, Germany
Filed Apr. 18, 1969, Ser. No. 817,416
Claims priority, application Germany, Apr. 20, 1968, P 17 56 206.0
Int. Cl. B65g *15/58, 17/46*
U.S. Cl. 198—41 **11 Claims**



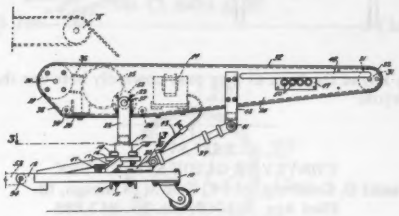
A magnetic conveying mechanism for transporting ferromagnetic cylindrical objects is disclosed. The new conveying mechanism includes two parallel endless chains having magnetized bars extending between them. The bars should be spaced a distance apart that is less than the diameter of the articles to be transported. Means for removing the transported articles from the magnetic belt at a point of direction change in the conveying system are also disclosed.

3,581,873
ENDLESS MAGNETIC CONVEYOR
Heinrich Spodig, Netterberge 84, 4711 Bork, Germany
Filed Aug. 7, 1968, Ser. No. 750,918
Claims priority, application Germany, Aug. 10, 1967, 15 56 P 15 56 183.8
Int. Cl. B65g *17/46*
U.S. Cl. 198—41 **6 Claims**



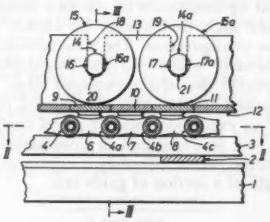
Endless magnetic conveyor comprising a belt, a support structure therefore, a magnet system disposed in said support structure, and means for revolving said belt about said support structure, the belt being formed of a magnetic material and having an active cross section relative to the flux of said magnet system adapted to provide a magnetic stray flux over and above saturation so that a holding action may be exerted on articles placed on said belt.

3,581,874
PORTABLE STACKING DEVICES FOR CONVEYORS
Milroy A. Keith, 5505 W. Colorado Place, Denver, Colo.
Filed May 26, 1969, Ser. No. 836,194
Int. Cl. B65g *21/00*
U.S. Cl. 198—121 **4 Claims**



A portable, relatively short, self-powered, reversible, belt conveyor arranged for attachment to a main conveyor to receive articles from or convey articles to the main conveyor. Said self-powered conveyor being pivotally mounted so as to be horizontally and vertically adjustable to conveniently stack the received articles for storage.

3,581,875
ROLLER CONVEYOR
Paul M. A. Guis, 133 Bis Rue Mouneyra, Bordeaux, (Gironde), France
Filed Feb. 14, 1968, Ser. No. 705,467
Claims priority, application France, Mar. 14, 1967, 1,515,395
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 **8 Claims**

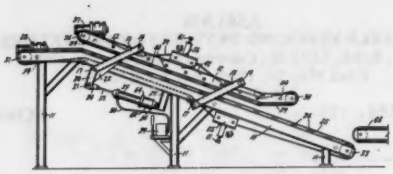


A roller conveyor wherein the load-supporting and transporting rollers are rotatable on shafts which are installed in stationary walls provided with oversized openings or vertical slots. The rollers rest by gravity on one or more aprons forming part of apron conveyors whose chains are driven by one or more reversible motors. When the aprons travel, their upper surfaces transmit rotary motion to the rollers by friction so that the load travels in a direction counter to that in which the aprons are driven by the chains. The shafts of the rollers are movable up and down with reference to the walls and are provided with flats which engage the surfaces of walls to prevent rotation of shafts with the rollers. The upper surface of each apron and/or the peripheral surfaces of the rollers can be provided with coats of friction generating material. Selected rollers can be disengaged from the aprons to arrest the load.

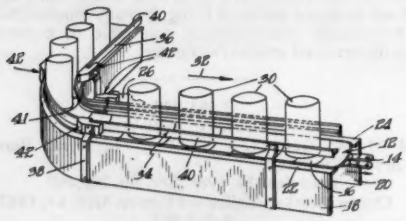
3,581,876
BAG FLATTENING CONVEYORS
Milroy A. Keith, 5505 W. Colorado Place, Denver, Colo.
Filed July 7, 1969, Ser. No. 839,296
Int. Cl. B65g *15/14*
U.S. Cl. 198—165 **6 Claims**

An inclined main belt conveyor having a floating belt conveyor maintained parallel thereover by means of parallel

links, the floating conveyor being provided with a plurality of individually sprung press rolls which individually and successively knead the bags as they pass upwardly between the two conveyors.

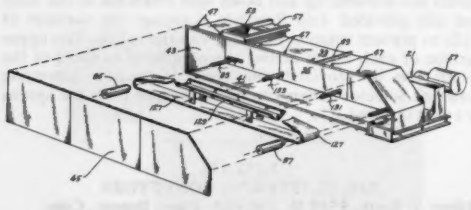


3,581,877
CONVEYOR GUIDE STRUCTURE
Nathaniel D. Goldberg, 154 E. Erie St., Chicago, Ill.
Filed Apr. 3, 1969, Ser. No. 813,085
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 **8 Claims**



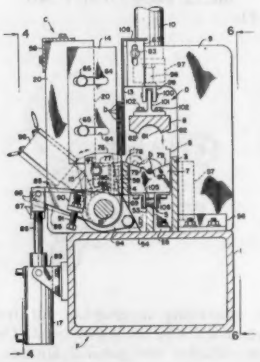
Guide rail structure for conveyor systems, which is designed to provide a smooth, friction free, nonmarring edge for engagement by containers or the like being transferred, and constructed such that it may be readily formed to a desired arcuate configuration. The structure includes a malleable rail element which carries thermoplastic bumper means that provide the aforementioned edge. The bumper means is comprised of a plurality of elements, operably interconnected by an expansion joint of novel design to obviate any problems due to expansion or contraction of the thermoplastic material, while affording a continuous edge along the entire length of a section of guide rail.

3,581,878
MATERIAL-HANDLING CONVEYOR MEANS
Bernhard E. Jacobson, Cedar FAlls, Iowa, assignor to Universal Manufacturing Company, Hudson, Iowa
Continuation-in-part of application Ser. No. 706,349, Feb. 19, 1968. This application May 7, 1969, Ser. No. 822,556
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 **6 Claims**



A material-handling conveyor means for food materials or the like including a horizontally disposed support beam having a first bearing means secured thereto adjacent one end thereof and a second bearing means adjustably movably mounted at the other end thereof. A driven shaft extends through the first bearing means horizontally from the beam and an idler shaft is mounted in the second bearing means and extends horizontally therefrom. The shafts support pulleys which have an endless conveyor belt mounted thereon. The conveyor belt is mounted in a casing which is secured to and supported by the support beam. One side of the casing is closed by a removable cover to facilitate the cleaning of the interior of the casing. A belt-takeup assembly is connected to the second bearing means to permit the idler shaft to be moved with respect to the driven shaft to adjust the tension in the conveyor belt. The takeup assembly includes means to maintain the idler shaft in a parallel relationship to the driven shaft as the tension in the conveyor belt is adjusted.

3,581,879
BAR FEEDER
Frank F. White, Shaker Heights; Norman J. Tanno, Kirtland, and Elmer T. Chipps, Jr., Mentor-on-the-Lake, all of, Ohio, assignors to Automation Development Corporation, Mentor, Ohio
Division of Ser. No. 600,350, Nov. 22, 1966, Pat. No. 3,480,159. Filed Nov. 24, 1969, Ser. No. 879,434
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 **7 Claims**

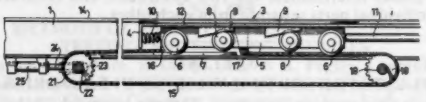


A bar and tube feeder having a narrow frame including a horizontal box beam of rectangular cross section and a pair of upright legs, a continuous conveyor comprising an endless chain mounted on sprockets near the opposite ends of said box beam, spaced bar-supporting carriers mounted on the chain, a guide bar on the beam for holding the upper flight of the chain parallel to the beam, means for supporting a stack of long bars parallel to the upper flight of the chain, and an improved escapement means to feed the lowermost bar from the stack to the carriers. The box beam has a length at least 10 feet and provides the main reinforcing element of the frame. The frame, including the legs and escapement means are narrow and have a width only slightly greater than that of the box beam so that the bar feeder occupies a minimum amount of floor space.

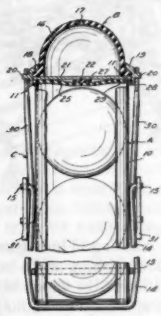
3,581,880
CONVEYOR
Per Iversen, Sogsti, Norway, assignor to Aktiebolaget Nordstroms Linbanor Kungsbroplan, Stockholm, Sweden
Filed Jan. 30, 1969, Ser. No. 795,248
Claims priority, application Sweden, Feb. 1, 1968, 1374/68
Int. Cl. B65g *25/02*
U.S. Cl. 198—219 **6 Claims**

A conveyor of the type which comprises at least one goods-supporting beam movably arranged in a track or guideway which extends in a fixed support surface along the

conveying path and which is adapted to be passed with its goods-supporting surface above said stationary support surface in the conveying direction and beneath said stationary support surface in the opposite direction.

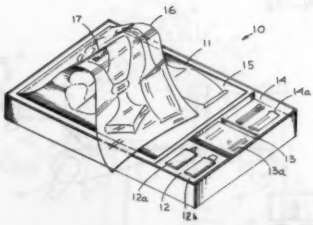


3,581,881
INFLATED CONTAINER FOR BALLS
James C. Hobbs, II, 4384 Ingraham Hwy, Miami, Fla.
Filed Mar. 17, 1969, Ser. No. 807,720
Int. Cl. A45c 11/00; B43k 31/00; B65d 85/00
U.S. Cl. 206—1 **2 Claims**



The invention is a pressuretight container with an open end and a closure, to seal the open end, that includes a hand operated air pump to pressurize the container.

3,581,882
COLLAGE ART
Jan Douglas Bish, 6160 Verdura, Goleta, Calif.
Filed Apr. 30, 1969, Ser. No. 820,518
Int. Cl. B44d 5/00; G09b 19/00
U.S. Cl. 206—1.7 **2 Claims**



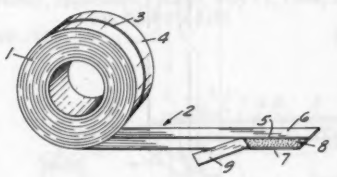
A collage art kit, containing a picture surface having sectionalized outlines of a picture printed thereon; an overlay sheet with a reproduction of said outlines with color instruction means thereon for each section of the picture surface, instruction means for adaptation and application of fragments of material to the picture surface; a second sheet with a second reproduction of said sectionalized outlines, each section of which being detachable perforated and provided with an adhesive for adherence and adaptation of the fragments of material thereto, and for application to the picture surface by way of separate means of adhesive, or adhesive means integral with and second sheet and subsequent to said application glazing means are poured onto the picture surface.

3,581,883
ROLLED PACKAGE OF FLEXIBLE CUSHIONING MATERIAL SECURED TO A BACKING MEMBER
Donald F. Whitney, Wellesley, Mass., assignor to Arthur G. Perry, Worcester, Mass., a part interest
Filed Nov. 22, 1967, Ser. No. 685,157
Int. Cl. B65d 85/00
U.S. Cl. 206—46 **3 Claims**

Container-forming material and containers formed thereby, the material being in a single sheet and including a layer of resilient, flexible cushioning material secured to a sheath or backing member which is flexible, so that a container is easily formed thereof e.g. manually by placing an article of substantially any shape on the cushioning material and rolling up the combined cushioning material with its backing or sheath, and then securing the edges together in a cylinderlike complete package; the cushioning material being compressed to some extent by this action, particularly in the area of the encompassed article; in addition end covers or caps may be applied to the rolled-up container aiding in maintaining the edges thereof together to form the complete package, with the sheath covering the entire outside of the package except for the ends; and in some cases applying cushioning material to the end caps themselves so as to prevent especially small heavy articles from shifting lengthwise of the package under impact to such an extent as to become damaged.

Urethane foam or other like resilient material and a single-faced corrugated board or the like, together make an ideal combination which can be rolled uniformly to form the package, somewhat in the nature of a mailing tube. Any profile or contour, including special article receiving cavities can be applied to the foam cushioning, or it may be coplanar, but in any case it is continuous across the sheet.

3,581,884
PRESSURE-SENSITIVE ACOUSTIC DOOR TAPE
Donald B. Caldwell, East Oakdale Township, Washington County, and Ralph C. Edberg, Mounds View Village, both of, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed June 1, 1967, Ser. No. 642,807
Int. Cl. E06b 2/23; B32b 3/02
U.S. Cl. 206—59 **2 Claims**



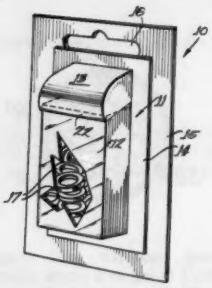
A plastic-film pressure-sensitive adhesive acoustic door tape that can be easily cut with scissors and adhered inside a door frame to provide a springy V-shaped plastic sound barrier sealing strip adapted to only slightly increase the force required for closing or opening the door. Also useful as a

weatherstrip for doors and windows. Supplied as a stable flattened creased tape wound in a roll, coated along one leg with a tacky pressure-sensitive adhesive stripe that is covered by a dry-strippable liner, which can be unwound and easily folded to provide a stable springy V-shaped strip.

3,581,885
BLISTER PACKAGE

Samuel K. Wald, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Sept. 26, 1969, Ser. No. 861,262
Int. Cl. B65d *75/58, 37/00*
U.S. Cl. 206—78 **6 Claims**

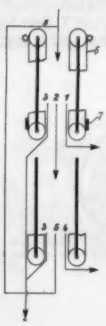


A blister package formed on a display card for the dispensing of articles contained within the blister, where the blister and flange are formed integral with an upper portion of the flange bent at an angle of approximately 20° rearwardly relative to the remainder of the flange, and a cut or slot is provided at the point of bending of the flange to allow, when the flange is returned to a planar position, the upper portion of the blister to overlap the lower portion thereof and retain the contents of the blister therein. Bending the top portion of the card mounting the blister and flange rearwardly opens the blister and exposes the contents for removal.

3,581,886
TWO-STAGE ELECTROSTATIC SEPARATION OF PARTICULATE MATERIAL

Arno Singewald, Kassel-Wilh; Guenter Fricke, Roeddense Ueber Lehrte, and Heinz Erbe, Diekholzen Ueber Hildesheim, all of, Germany, assignors to Wintershall Aktiengesellschaft, Kassel, Germany. Claims priority, application Germany, Nov. 9, 1965, W40,257

Continuation-in-part of application Ser. No. 592,863, Nov. 8, 1966, now abandoned. This application July 7, 1969, Ser. No. 839,367
Int. Cl. B03b *1/04;* **B03c** *7/08*
U.S. Cl. 209—9 **12 Claims**

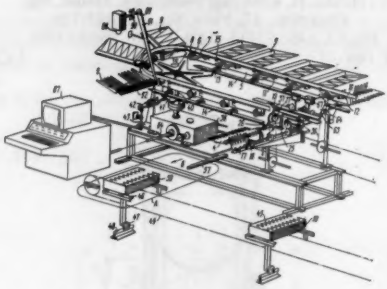


Separation of potassium oxide containing salts into various size fractions by passing a mass containing particulate and powder fractions between two electrodes of an electrostatic precipitator; maintaining the voltage across the electrodes such that the mass separates into portions, that part adheres to the positive electrode, part stays adjacent the positive electrode, part stays adjacent the negative electrode, and part passes intermediate the two electrodes; and recovering the individual parts separate from each other.

3,581,887
PLANTS FOR SORTING WASHING IN LAUNDRIES

Grigory Avramovich Radutsky, Tbilissky pereulok, 3, kv. 8, and Rafail Efimovich Kheifets, Brest-Litovsky prospekt 162, kv. 30, both of Kiev, U.S.S.R.

Filed July 7, 1969, Ser. No. 839,260
Int. Cl. B07c *5/36*
U.S. Cl. 209—73 **5 Claims**

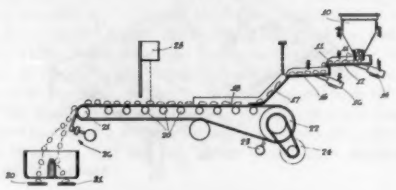


A plant for sorting washing in laundries, comprising a conveyor for sorting ironed washing and a bunker with compartments and movable shelves, in which the conveyor is made horizontal and closed and has one hauling chain fashioned as interhinged carriages equipped with comblike cantilever hangers mounted with a possibility of turning, the bunker having combs cooperating with the hangers, and washing level sensors.

3,581,888
POSITION MEMORY SYSTEM

Leonard Kelly, Peterborough, Ontario, and George R. Mounce, Willowdale, Ontario, both of, Canada, assignors to Sphere Investments Limited, Nassau, Bahamas

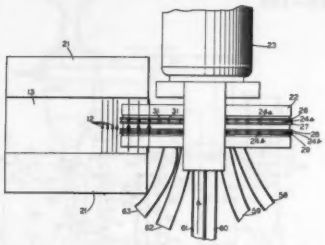
Filed Dec. 24, 1969, Ser. No. 887,841
Claims priority, application Great Britain, Dec. 31, 1968, 61888/68
Int. Cl. B07c *5/342*
U.S. Cl. 209—74 **8 Claims**



A memory system for storing positional information of objects moving through a zone. The zone has a number of imaginary channels, and the system provides a number of modules which are fewer in number than the number of imaginary channels. A scanning device makes repeated scans across the zone and each module stores information on one particular object being traversed by the scan. A storage register is provided for each channel and a module actuates one or more storage registers according to the lateral position and extent of an object, to store a signal representing

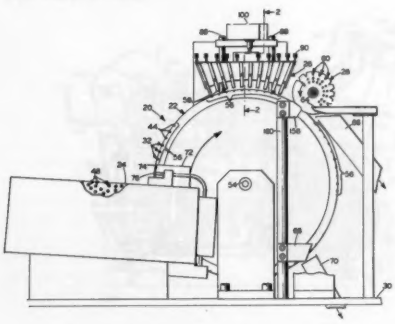
longitudinal extent of an object. The storage registers advance at a rate related to the rate of movement of the objects.

3,581,889
METHODS OF AND APPARATUS FOR FEEDING, TESTING, AND SORTING ARTICLES
Bruce C. Abraham, Reading; Charles R. Fegley, Laureldale, and Robert L. Seis, Reading, all of, Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.
Filed July 30, 1969, Ser. No. 846,110
Int. Cl. B07c *5/00*
U.S. Cl. 209—74 **10 Claims**



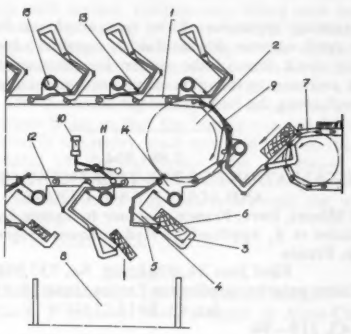
An article, such as a magnetically leaded device, can be carried by a carrier wheel from an input position to a testing location where the article is tested and classified into one of a plurality of categories in accordance with the test. The characteristics of a test, for each category, are stored in a corresponding shift register. The carrier wheel transports the articles past a number of force-field producing elements such as electromagnets which are activated by the corresponding outputs of the shift registers. Activation of an elements removes the proximate article from the wheel so that it falls into an appropriate output chute into an output bin corresponding to the tested category.

3,581,890
METHODS OF AND APPARATUS FOR SORTING ARTICLES
Donald D. DeMuzio, Reading, and Russell W. Ingham, Wyomissing, both of, Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.
Filed July 30, 1969, Ser. No. 846,111
Int. Cl. B07c *5/00*
U.S. Cl. 209—74 **22 Claims**



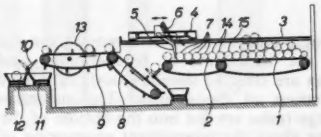
Magnetic articles, for example, diodes having magnetic leads, are loaded onto an indexable feed drum and into testing positions arranged in spaced clusters. Each diode is supported within one of the clusters with equal spacing between adjacent diodes. The drum is indexed so that one cluster at a time is placed beneath a reciprocating testing fixture. The fixture is lowered into engagement with the diodes of a cluster and those diodes having a desired characteristic, in this case low internal noise, are detected. Each segment of the testing fixture is independently linked to an electromagnet positioned on a rotatable sorting drum. The sorting drum is mounted to rotate mutually with the feed drum so that each of the electromagnets of the sorting drum becomes adjacent a particular one of the diodes of a cluster. Each of the electromagnets which is associated with a segment of the testing fixture in which a high noise level has been detected in a diode is energized and when such electromagnet moves past the associated diode on the feed drum, such diode is attracted to the electromagnet of the sorting drum and is subsequently collected from the sorting drum. Diodes having suitably low noise levels move past the sorting drum without being attracted by one of the electromagnets since the electromagnets adjacent the low noise diodes are not energized. Such low noise diodes are collected in a separate facility. Sorting of the diodes in accordance with their noise level is thereby accomplished.

3,581,891
LOADING AND SORTING DEVICE FOR SAWN TIMBER
Alpo Rysti, Frisansintie 22, Frisans, Finland
Filed Dec. 9, 1968, Ser. No. 782,392
Claims priority, application Finland, Sept. 26, 1968, 2725/68
Int. Cl. B07c *3/02*
U.S. Cl. 209—74 **3 Claims**



A device for loading and sorting sawn timber includes a conveyor carrying hooklike members. These hooklike members have shaft portions adapted engage pieces of timber and movable retainers which support these pieces and are adapted to swing and release these pieces which then drop downwardly along the shaft portions.

3,581,892
DEVICE FOR SORTING PIECES OF TIMBER, SUCH AS LOGS, ON THE TIMBER RECEIVING TABLE
Erkki Aro, Muottikatu 18, Hyvinkaa, Finland
Filed May 9, 1969, Ser. No. 823,328
Claims priority, application Finland, July 11, 1968, 1993/68
Int. Cl. B07c *5/36*
U.S. Cl. 209—125 **5 Claims**



A device is provided for sorting timber on a timber receiving table upon which the timber bundle is placed. The device consists of a carriage reciprocally movable in the direction of

travel of the timber above the table and having downwardly directed arms which can be extended into the path of the timber for the purpose of grouping and shifting the pieces of timber, and which can be moved out of the path of the timber for the purpose of permitting free movement of the timber.

3,581,893

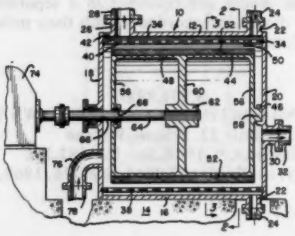
SCREENING APPARATUS

John P. Rich, Nashua, N.H., assignor to Improved Machinery Inc., Washua, N.H.

Continuation of application Ser. No. 695,027, Jan. 2, 1968, now abandoned. This application Jan. 9, 1970, Ser. No. 578

Int. Cl. B01d *29/38*

U.S. Cl. 209—273 **8 Claims**



Screening apparatus of the type employed for screening pulp stock wherein diluent fluid is supplied adjacent the accepted stock face of the screen for diluting the accepted stock and causing it to flow in a direction counter to the flow of stock along the feed face of the screen.

3,581,894

INSTALLATION FOR THE TREATMENT OF WATER AND AQUEOUS SOLUTIONS

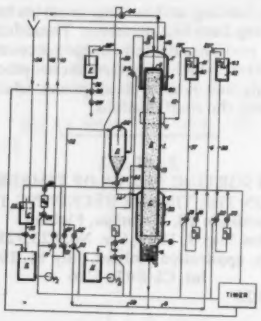
Paul Minart, Isere, France, assignor to Societe Grenobloise d, Etudes et d, Applications Hydrauliques (Sogreah), Grenoble, France

Filed June 14, 1968, Ser. No. 737,098

Claims priority, application France, June 14, 1967, 5126

Int. Cl. B01d *15/04*

U.S. Cl. 210—96 **12 Claims**



A single column contains a moving ion-exchange bed in which the treatments of regeneration, washing and exhaustion are effected simultaneously in three different vertical sections of the column. The successive batches of exchange resins are fed into the bottom of the column so as to bring about the intermittent progression of the bed, and each successive batch of resins is recovered at the top of the column. The rates of flow of the purified liquid, the regenerant flow and the discharged effluent are controlled so that the raw liquid inflow rate automatically adjusts itself to assure that an adequate flow distribution will be maintained in the different sections of the column.

3,581,895

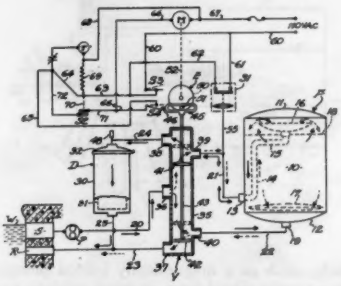
AUTOMATIC BACKWASHING FILTER SYSTEM FOR SWIMMING POOLS

Herbert H. Howard, Encino; Henry R. Young, Arleta; Jack A. Berg, Encino, and Bernard Bellinson, Sherman Oaks, all of, Calif., assignors to Herbert H. Howard; Henry R. Young and Marine Swimming Pool Equipment Co., North Hollywood, Calif., by said Herbert H. Howard and Henry R. Young

Filed Feb. 28, 1969, Ser. No. 803,244

Int. Cl. B01d *29/38*

U.S. Cl. 210—108 **10 Claims**



A pressure-responsive switch senses the rising back pressure in a sand filter caused by debris collected in the filter, and at a predetermined pressure indicating the need for cleaning the filter, it triggers the reversal of valve means which reverses the flow in the filter and backwashes the debris into a separating tank where the debris is collected from the backwash flow which is then returned to the swimming pool. A timer controls the backwashing interval, at the end of which the valve is again reversed by a reversing mechanism, returning the system to normal filtering operation.

3,581,896

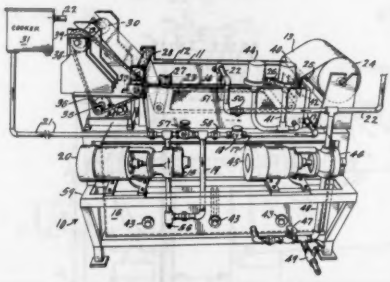
AUTOMATIC COOKING OIL FILTER AND LEVEL CONTROL APPARATUS

Walter F. Kuhlman, Norwalk, Ohio, assignor to The Roto Corporation, Norwalk, Ohio

Filed July 23, 1969, Ser. No. 843,941

Int. Cl. B01d *33/00*

U.S. Cl. 210—134 **9 Claims**



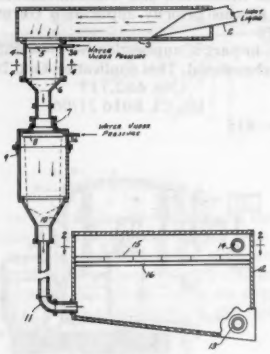
Apparatus for continuously removing contaminated cooking oil from a cooker, filtering the removed oil and returning the filtered oil to the cooker. A portion of a long roll of disposable filter paper filters the oil. The filter paper is advanced whenever the filtering portion becomes dirty. The apparatus includes an oil storage reservoir and means connecting to the reservoir for maintaining a constant oil level in the cooker.

3,581,897

APPARATUS FOR THE PREVENTION OF AIR AND WATER POLLUTION IN THE MAKING OF WOODPULP FOR PAPER MAKING

Walter C. Eggert, 19060 11th Ave. Northwest, Seattle, Wash.

Filed Dec. 15, 1969, Ser. No. 884,994
Int. Cl. B01d *21/02*
U.S. Cl. 210—199 10 Claims



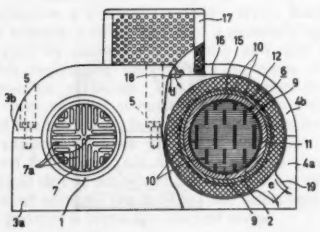
Apparatus for treating the liquid containing residue chemicals from the processing of woodpulp. The apparatus consists of a duct leading to a series of water spray chambers through which the liquid is passed, being cooled and combining with the spray water. The resulting liquid is conducted into a covered receiving tank having a sloping bottom wall for collecting chemical sludge. The receiving tank has filter trays for filtering the liquid rising into the upper portion of the tank, with an overflow pipe at said upper portion for drawing off the filtered liquid. The tank has a lower drain conduit for draining off the chemical sludge to a separate collection point.

3,581,898

MAGNETIC FILTER

Arthur James Tyrrell, Ashtead, England, assignor to U. S. Philips Corporation, New York, N.Y.

Filed May 19, 1969, Ser. No. 825,770
Int. Cl. B01d *35/06*
U.S. Cl. 210—222 5 Claims



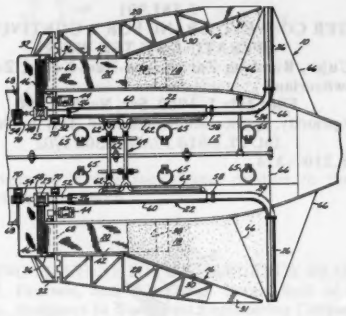
A magnetic filter for use in a pipeline which separates ferromagnetic particles from the fluid within the pipeline. Filtering grids arranged within two pipes are energized by externally surrounding coils, such that the flux generated in one pipe is carried by the other pipe.

3,581,899

APPARATUS FOR SEPARATING OIL FROM WATER SURFACE

Raymond E. Hunter, Lomita, Calif., assignor to Ocean Design Engineering Corporation, Long Beach, Calif.

Filed Apr. 8, 1970, Ser. No. 26,666
Int. Cl. B01d *15/02*
U.S. Cl. 210—242 6 Claims



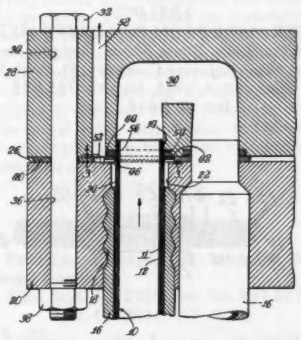
An apparatus for separating oil from a water surface by distributing many small buoyant bodies of oil absorbent material upon such surface, continuously lifting such bodies from the surface, treating the bodies to remove the absorbed oil, and again distributing the bodies upon the surface for reuse. The apparatus preferably includes booms for gathering the distributed bodies of absorbent material toward a conveyor which lifts the bodies upwardly. The booms are articulated and include floats so that the booms rise and fall with any wave action of the water, such as would exist in the unprotected waters of the open sea. The apparatus also preferably includes a system for compressing the oil from the bodies, and thereafter dropping the bodies onto the water surface for recycling.

3,581,900

REVERSE OSMOSIS LIQUID PURIFICATION

George B. Clark, Waukesha, Wis., assignor to Aqua-Chem, Inc.

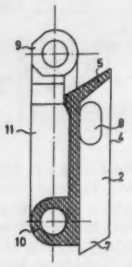
Continuation-in-part of application Ser. No. 724,663, Mar. 20, 1968, now abandoned, Continuation-in-part of application Ser. No. 678,051, Oct. 25, 1967, now abandoned. This application Jan. 3, 1969, Ser. No. 788,871
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—321 28 Claims



An expendable tubular membrane structure for use in reverse osmosis liquid purification equipment including a

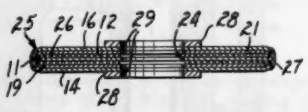
rigid supporting tube for supporting the membrane structure, the expendable membrane comprising a porous, semirigid, thin-walled tube adapted to be received within the supporting tube, and which may have an outer, grooved surface. A liquid impervious plastic material is provided at both ends of the porous tube, and a film of semipermeable membrane material is bonded to the interior wall of the porous tube; a method of making the expendable membrane; and an apparatus utilizing the same.

3,581,901
FILTER CONVEYOR BAND FOR A CONTINUOUSLY OPERATING FILTER PRESS
Hans Gujer, Rumlang Zurich, and Karl Koller, Zurich, both of, Switzerland
Filed July 1, 1969, Ser. No. 838,296
Claims priority, application Switzerland, July 2, 1968, 9847/68
Int. Cl. B01d *33/04;* **B30b** *9/02*
U.S. Cl. 210—324 **5 Claims**



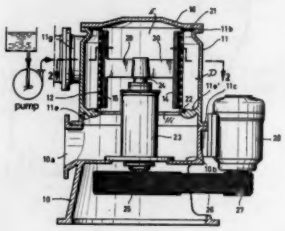
There is disclosed a filter conveyor band or belt for a continuously operating filter press, preferably of the vertical type, which includes hingedly interconnected links having drainage grooves extending longitudinally of the link with the forward ends of the grooves being open and means being provided to close the rearward ends of the grooves. There are longitudinally extending ribs that separate the grooves with such ribs having forward ends that are inclined forwardly of and away from the top surface of the ribs. The means that close the rear ends of the grooves including a rear surface as regards the direction of movement that is inclined correspondingly to the inclination of the forward ends of the ribs so that such forward ends of the ribs of a trailing link cooperate with such rear surface of a preceding link to be in at least approximately adjoining relation with such rear surface when the band is straight and to define a gap which narrows in the direction away from the tops of the ribs when the band is curved.

3,581,902
FILTER MADE FROM POWDERED METAL
James L. Bidler, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 4, 1968, Ser. No. 765,089
Int. Cl. B01d *25/02*
U.S. Cl. 210—347 **6 Claims**



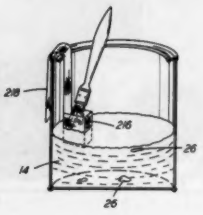
A metallurgically integral filter comprising sintered laminae of shaped powdered metal, said laminae comprising an impervious structural member, a filter element, and a pervious support member sandwiched between said structural member and said filter element, with a drainage space between said structural member and said pervious support member. A series of such sintered filters can be stacked within a housing in spaced relation with the drainage areas of said filters communicating with a discharge pipe, to form a filter assembly useful in removing solid particles from liquids or gases.

3,581,903
SEPARATOR FOR PAPER PULP SUSPENSIONS
Emil Holz, Reutlingen-Betzingen, Germany, assignor to Herman Finckh Metalltuch-und Maschinenfabrik, Reutlingen, Germany. Claims priority application Germany, Sept. 16, 1964 F26679
Continuation-in-part of application Ser. No. 485,473, Sept. 7, 1965, now abandoned. This application Oct. 26, 1967, Ser. No. 682,717
Int. Cl. B01d *21/06*
U.S. Cl. 210—415 **5 Claims**



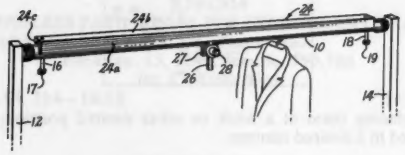
Separator for paper pulp suspension in which the apparatus has a pressurized housing with a cylindrical screen dividing said housing into an annular outer chamber which encircles a cylindrical inner chamber into which latter by pressure means, including a pump, pulp is forced through said screen and thence out of said housing, said screen being free of round holes capable of passing large round or cubical fiber bundles and comprising a multiplicity of narrow elongated slitlike apertures in the upstream face thereof, each connecting with a wider elongated groove in the downstream face of said screen, the slits passing only thin, small fibers or particles and the apertures combining with the back pressure of foils rotating against the downstream face of the screen, with the venturi shape of the apertures and with the forward pressure of pump to successively create alternate outward jets and inward flow in said slits to free any particles jammed therein by said pumping pressure.

3,581,904
ADJUSTABLE LEVEL PAINT SIEVE
Anthony G. Selby, 3012 Linwood Ave, Baltimore, Md.
Filed Mar. 10, 1970, Ser. No. 18,083
Int. Cl. B01d *35/28*
U.S. Cl. 210—470 **1 Claim**



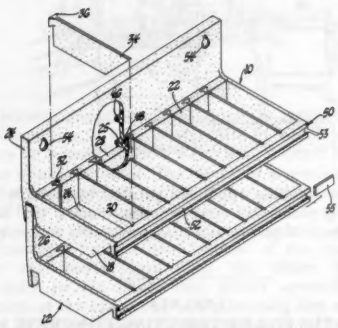
A paint sieve having a top opening to receive a brush and adapted for variable height attachment inside a paint bucket so that the sieve can be raised or lowered in the bucket to remain partially immersed in the paint during painting, always providing a sludge-free well of paint in the sieve from which paint can be removed by brush as needed.

3,581,905
GARMENT DISPLAY CASE
Laurence L. Shapiro, Massapequa Park, N.Y., and Vincent Parillo, Highland Park, N.J., assignors to Bond Stores, Incorporated, New York, N.Y.
Filed Apr. 21, 1969, Ser. No. 817,707
Int. Cl. E05b *73/00*
U.S. Cl. 211—7 **2 Claims**



A device for locking a plurality of hangers onto a display bar which includes a guard rail mounted at both ends of the bar in such a manner that both ends slide vertically and uniformly as the rail is raised and lowered into lock position. Opposing the mounted side of the rail is an overhanging lip which is adapted to contact the hooks of the hangers on the bar when the rail is in lock position.

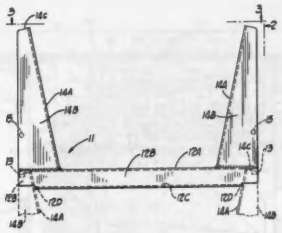
3,581,906
STORAGE BIN
James E. Joyce, 878 Darien Circle, Rochester, Mich.
Filed Feb. 11, 1969, Ser. No. 798,371
Int. Cl. A47f *3/14*; **B65b** *21/00*
U.S. Cl. 211—126 **11 Claims**



A storage bin construction which permits several such bins to be assembled in a vertically stacked array. Each bin includes a flat bottom, a front wall, and a generally upstanding rear wall joined by sidewalls. The front and rear walls are provided with registering vertical slot openings to accommodate removable partitions. The slot openings in the rear wall extend into vertical strengthening ribs formed on the outer face of the rear wall. In addition, each bin includes an upstanding support member joined to and generally rearwardly spaced from said rear wall to define a downwardly opening vertical slot to receive the upper portion of the support member of another similar bin into telescopic relation therewith to provide a vertically stacked array.

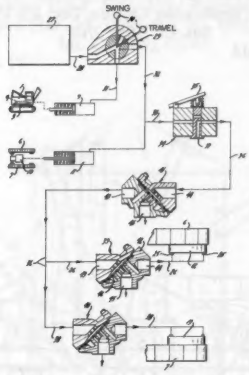
3,581,907
RACK FRAME
William F. Schmidt, Cleveland, Ohio, assignor to Pucel Enterprises, Inc., Cleveland, Ohio
Filed Oct. 30, 1968, Ser. No. 771,951
Int. Cl. A47f *5/10, 7/00*; **B65d** *19/38*
U.S. Cl. 211—177 **9 Claims**

A rack frame having a horizontal base and two spaced uprights for holding bars, rods, slabs or the like, the frame being made to interfit with the other of superimposed similar rack frames arranged in tiers for resisting longitudinal and



lateral movement of one rack frame relative to the rack frame interfitted therewith.

3,581,908
LOGGING MACHINE WITH EMERGENCY BRAKE
William M. Pearson, and Winfred J. Sorge, both of Green Bay, Wis., assignors to Northwest Engineering Corporation, Green Bay, Wis.
Filed Aug. 19, 1969, Ser. No. 851,244
Int. Cl. B66c *23/06*
U.S. Cl. 212—59 **8 Claims**

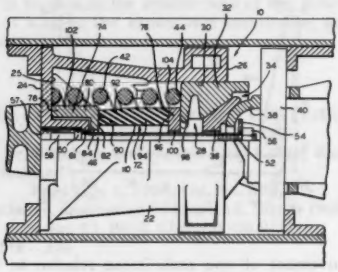


A logging machine having emergency brakes which are normally spring biased into engagement and which are disengaged by air pressure. The brakes are connected through a pedal-operated brake control valve and a hand-operated swing-travel control valve to a source of pressurized air. When the latter valve is in the travel mode and the pedal valve is held open by the foot, air disengages the brakes. When the pedal is released, air is exhausted from the line between the pedal valve and brakes to set them. Quick release valves in said line provide fast independent exhausting of separate line sections.

3,581,909
FRICTION DRAFT GEAR
Bertil E. Peterson, Chicago, Ill., assignor to Cardwell Westinghouse Company
Filed Sept. 15, 1969, Ser. No. 857,881
Int. Cl. B61g *9/06, 9/14*
U.S. Cl. 213—34 **9 Claims**

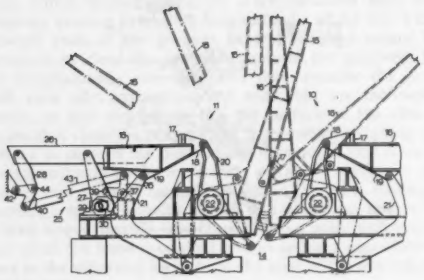
The disclosure relates to a friction draft gear of the type shown in U.S. Pat. No. 2,496,442 in which a supplemental resistance arrangement is interposed between the friction shoe and the closed wall of the gear casing in the form of a flat spring seat engaging the shoes, a pedestal engaging the casing closed end, and a tubular butyl rubber member

received between the spring seat and the pedestal with all three being received within and spaced from a helical spring



that is applied between the shoes and the casing closed wall and parallel with the helical spring.

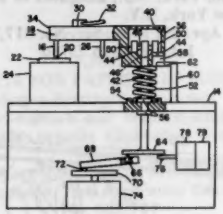
3,581,910
TURNOVER APPARATUS
Michael Frank Field, Dollard Des Oremeaux, Quebec, Canada, and John Frederick Barry Wood, Burlington, Vt., assignors to Dominion Engineering Works Limited, Montreal, Canada
Filed Dec. 15, 1969, Ser. No. 885,130
Claims priority, application Canada, Dec. 13, 1968, 37,706
Int. Cl. B65g *7/00*
U.S. Cl. 214—10A **10 Claims**



The disclosure of the present invention relates to a device for turning a rolled steelplate from a faceup to a facedown position, where the plate is caused to pass from an horizontal receiving position to an intermediate vertical position and, finally, to an horizontal discharge position. The device includes two tipping arms, one located in the receiving position and the other in the discharge position, adapted to be brought into the intermediate position for effecting a turning and transferring of the plate. The arms are mounted on separate rotatable shafts located in the intermediate position where they are connected to inboard arms so constructed and located as to cause the inboard edge of the plate to drop down below the receiving position. Additional arms are connected to the outboard end of the tipping arms.

3,581,911
DIE-POSITIONING MECHANISM
Lee Edward Folk, Phoenix, Ariz., assignor to Motorola Inc., Franklin Park, Ill.
Filed July 15, 1969, Ser. No. 841,849
Int. Cl. B65h *1/02*
U.S. Cl. 214—1 **7 Claims**

A machine is disclosed for taking thin dies of very small size out of a container where they are randomly oriented, placing them at an orienting position and orienting them, and

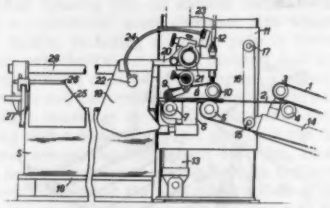


then placing them at a work or other desired position, all oriented in a desired manner.

ERRATUM

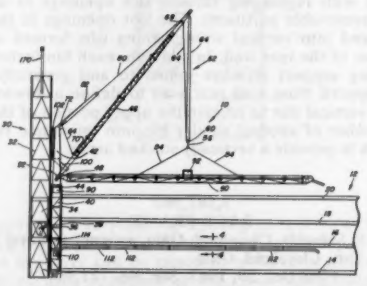
For Class 214—1.1 see:
Patent No. 3,582,000

3,581,912
APPARATUS FOR STACKING SHEETS
John P. Bennett, Summerstown, London, England, assignor to Masson Scott Thrissell Engineering Limited, London, England
Filed Sept. 25, 1968, Ser. No. 762,596
Claims priority, application Great Britain, Sept. 27, 1967, 43951/67
Int. Cl. B65g *57/09*
U.S. Cl. 214—6 **4 Claims**



In a sheet stacking apparatus producing multiple stacks with dividing plates between adjacent stacks, the dividing plates are made of plastic material, preferably an epoxy/glass laminate.

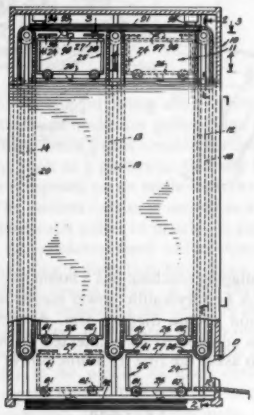
3,581,913
APPARATUS FOR DISTRIBUTING CONCRETE MIX
Gilbert Hay, Jr., Wauconda, Ill., and Hans K. Bell, Cincinnati, Ohio, assignors to Hi-Dyne, Inc., Des Plaines, Ill.
Filed Nov. 1, 1968, Ser. No. 772,514
Int. Cl. B66b *17/00*
U.S. Cl. 214—89 **7 Claims**



Improved apparatus for distributing concrete mix above ground level in a multilevel construction project includes a

boom and a conveyor frame, each pivotally secured on a rotatable base at the level at which concrete mix is to be distributed, with the free end of the conveyor frame being suspended from the boom. The system preferably further comprises a concrete pump provided above ground level, with hose means being provided for conveying concrete mix from the concrete pump to various positions at levels above the ground level as well.

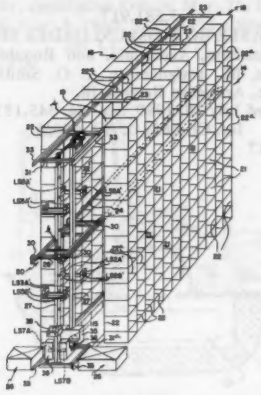
3,581,914
ENDLESS PATH MEANS FOR STORING ARTICLES
Joseph Bosco, 33 Summer St., Everett, Mass.
Filed Jan. 13, 1969, Ser. No. 790,786
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1B **3 Claims**



The present invention relates to storing means for automobiles, comprising, a vertical structure in which a number of cars may be housed in stalls which are mounted in the structure one above the other. The structure is provided with two pairs of a group of four vertical link chain mechanisms. One group of four link chains are operable to move upwardly, and the other set in the group to move downwardly. Also there is a mechanism which at the bottom of the housing may transfer the stored cars from the chain that moves downwardly to the chain that moves upwardly. Also a mechanism at the upper end of the housing that will transfer the cars from the chain that moves upwardly to the chain that moves downwardly. Thus it is possible to circulate the stored cars in a closed shuttle. At the lower end of the housing a car may be driven through a door into an empty stall for parking or a car may be driven off the lower stall. The operation of the upwardly and downwardly moving group of chains and the stall transfering mechanisms are being operable in timed relationship with one another and are being controlled by the car driver by simply depressing a button in a control panel.

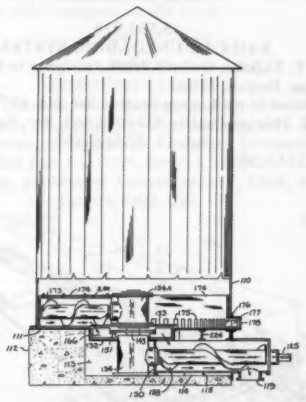
3,581,915
STACKER CRANE POSITION CONTROL SYSTEM WITH AN AUXILLARY VERIFYING MEANS
Sanford Saul, Cleveland, Ohio, assignor to The Triax Company, Cleveland, Ohio
Filed Sept. 19, 1968, Ser. No. 760,873
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4A **12 Claims**

An automatic warehousing system comprising a storage structure defining a plurality of load-handling locations, and an automatic load carrier for delivering loads to and picking up loads from the load-handling locations, with the control system for the load carrier including command-receiving and movement-determining means for controlling the movement of the load carrier to a selected load-handling location, and with verifying means coacting with the control means for verifying the accuracy of the positioning of the load carrier at



selected load-handling locations prior to final handling of loads by the load carrier at the selected storage locations.

3,581,916
UNLOADER FOR CYLINDRICAL CONTAINERS
Ivan S. Brumagim, 109 E. Fifth Ave., Warren, Pa.
Filed Mar. 20, 1969, Ser. No. 808,899
Int. Cl. B65g *65/46*
U.S. Cl. 214—17 **8 Claims**



This specification discloses a bottom unloader for a silo. The silo has a floor. A radially extending manway is disposed below the floor and a transfer pit is disposed below the floor and above the manway. A vertical shaft is disposed on the centerline of the silo and extends from the manway up above the floor. A half-cylinderlike trough is supported below the transfer pit in the manway and a first screw conveyor is disposed in the trough. The first screw conveyor has a connection on its outer end for connecting to a drive motor. The inner end of the first conveyor is connected to the vertical shaft by a set of bevel gears. A second conveyor screw is disposed above the floor and has its inner end connected to the vertical shaft by a second set of bevel gears. The outer end of the second screw is connected to a ring that is supported around the inner periphery of the silo. A hydraulic ram moves the ring and thereby swings the second screw around the vertical shaft while it is being rotated by the vertical shaft. A half-cylinder-shaped shroud is supported over the trailing half of the second screw. Thus, the second screw

moves material from the bottom of the silo into the transfer pit. Blades on the vertical shaft in the transfer pit move the material from the transfer pit to the first conveyor where it is moved out through the manway.

3,581,917

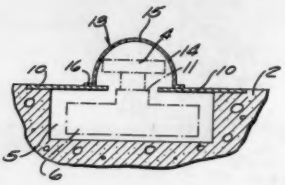
DISPOSABLE BOTTOM UNLOADER SHIELD

Edward W. Fundahn, Algonquin, and Ronald K. Krause, Crystal Lake, Ill., assignors to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed July 28, 1969, Ser. No. 845,151

Int. Cl. B65g *65/42, 65/46*

U.S. Cl. 214—17 **6 Claims**



The disposable bottom unloader shield consists of a shield of an edible or neutral material, so that animals can digest it or it will assimilate with the stored material, having a configuration of a shape to provide a void in the bottom of a silo so that a bottom unloader can easily be started or inserted beneath the shield after the silo has been filled. An example of such a shield would be one of the general shape of a hat placed over a flail-type unloader which is coiled upon itself around a central drive shaft, and which would be destroyed by the flail after startup.

3,581,918

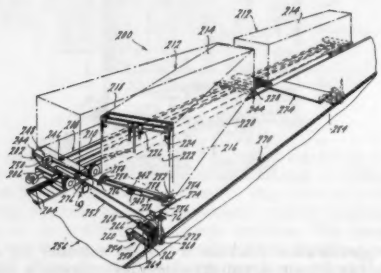
RAILCAR-UNLOADING SYSTEM

Richard T. Fujioka, Oxford, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Continuation-in-part of application Ser. No. 697,427, Jan. 12, 1968. This application May 5, 1969, Ser. No. 821,930

Int. Cl. B65g *67/02*

U.S. Cl. 214—38 **14 Claims**



A railcar-unloading system comprising a wheeled vehicle such as a railroad flatcar or the like adapted to traverse a railroad track and having a generally flat horizontally extending cargo-supporting bed; an elongated, generally rectangular-shaped cargo-carrying container disposed on the cargo bed; means in the form of a plurality of pivotable and elevatable support mechanisms interposed between the lower side of the container and the upper side of the cargo bed and located one adjacent each of the four corners of the lower side of the container, whereby the container is adapted to the pivotably biased at each of the mechanisms between a transit position and a plurality of loading and/or unloading positions, and at least one transfer bridge assembly adapted to be selectively disposed at a support position extending outwardly from the cargo bed for supporting the cargo container when it is moved to and from its loading and/or unloading positions.

3,581,919

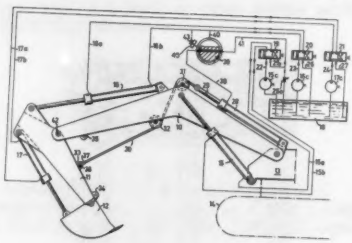
HYDRAULIC DIGGING MACHINES

Hans Egron Karlsson, Sater, Sweden, assignor to Teredo Maskin A.B., Stockholm, Sweden

Filed Sept. 23, 1968, Ser. No. 761,655

Int. Cl. E02f *3/62*

U.S. Cl. 214—138 **3 Claims**



A hydraulic digging machine has a boom and a digging arm with a bucket. A first hydraulic power means is employed for normal operation of the digging arm. A second hydraulic power means is adapted to be connected to the digging arm when desired to assist the first hydraulic power means.

3,581,920

METHODS OF MIXING DIFFERENT BULK MATERIALS

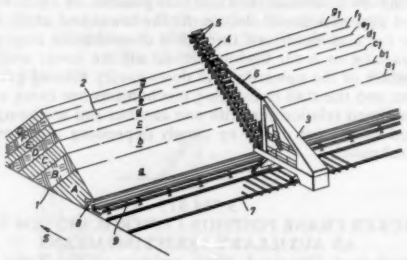
Gunter Strocker, Holzwickede, and Gerhard Fischer, Dortmund-Kirchhorde, both of, Germany, assignors to Gustav Schade Machinenfabrik, Dortmund, am Rosenplatzchen, Germany

Filed Feb. 3, 1969, Ser. No. 796,088

Claims priority, application Germany, Jan. 23, 1969, P 12 81 942.0

Int. Cl. B65g *59/00*

U.S. Cl. 214—152 **3 Claims**

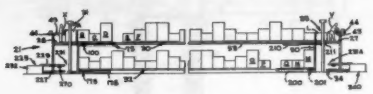


A method of mixing different bulk materials includes the formation of a dump pile made up of a plurality of layers of different material. Each layer extends from the base of the pile to the surface thereof. Material is then removed by scraping along the surface of the pile transversely of the layers so that the removed material comprises a mixture of material of each layer outcropping at the surface of the pile.

3,581,921
METHOD OF PROCESSING ARTICLES ON AN ENDLESS CONVEYOR IN A WAREHOUSE

Mathew G. Boissevain, Los Altos Hills, and Robert J. Traube, San Mateo, both of, Calif., assignors to FMC Corporation, San Jose, Calif.

Continuation of application Ser. No. 810,423, Jan. 2, 1969, now abandoned , which is a division of application Ser. No. 697,381, Jan. 21, 1968, now Patent No. 3,458,062. This application Oct. 16, 1969, Ser. No. 867,431
Int. Cl. B65g *1/06*
U.S. Cl. 214—152 2 Claims

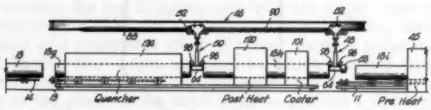


Articles to be picked for filling orders from retail outlets are stored in the warehouse on pallets, and each pallet is disposed on a tray. Each pallet contains articles of one particular category, such as a particular size and brand of soap, and the trays are disposed on an endless carrier in a predetermined order. The endless carrier is moved in a generally vertical plane so that each pallet of articles is presented to the order-filler in the predetermined order. Apparatus is provided for replenishing pallets that have been emptied while keeping them in the desired order. A tape that has labels arranged in a sequence indicating the category and the number of articles to be picked, is prepared in advance by one who knows the sequence of the trays in the endless carrier and the number of items to be picked of each category and can therefore prepare the tape so that the trays may be processed in said predetermined order. Accordingly, following the method of the present invention, the order-picker is able to receive his instructions from the tape, index the necessary tray to the order-picking station and pick the desired number of articles therefrom.

3,581,922
METHOD AND APPARATUS FOR COATING TUBULAR OBJECTS

Harry N. Versoy, New Orleans, and Robert J. Harris, Marrero, both of, La., assignors to H. C. Price Co., Bartlesville, Okla.

Filed Dec. 11, 1967, Ser. No. 689,646
Int. Cl. B65h *51/00*
U.S. Cl. 214—338 11 Claims

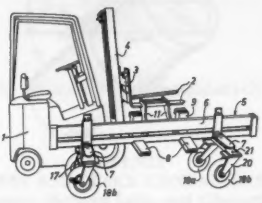


A relatively high speed, continuous method and novel apparatus, especially adapted to large diameter steel pipe, for applying external thin-mill coatings, such as thermal setting epoxy and epoxy resins, wherein the pipe sections are successively advanced in a train and continuously rotated through numerous operating stations, and embodying a changeover from an external roller drive line to an internal conveyor system. The pipe overhead suspension system permits even mill coating over the complete surface of the pipe and precludes damage to the coating during curing and while it is in the critical fluid state.

3,581,923
FORKLIFT TRUCKS

Jean-Francois Archer, 2, Hameau des Perdrix,, 78 La Celle Saint-Cloud, France

Filed Mar. 21, 1969, Ser. No. 809,217
Claims priority, application France, Mar. 29, 1968, Apr. 10, 1968, Mar. 5, 1969, 3485;3492;6,906,008
Int. Cl. B66f *9/12*
U.S. Cl. 214—620 19 Claims

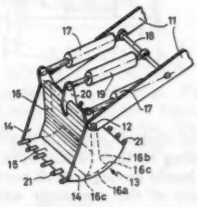


To enable a conventional forklift truck with front mounted forks to be used as a side lift truck the invention provides an auxiliary carriage arrangement comprising a longitudinal member, supporting arms attached to said longitudinal member, means for fixing said longitudinal member to the lifting panel of the forklift truck so that it is perpendicular to said panel, and at least two transverse arms each carrying at least one pivoting wheel and mounted themselves in pivotable relationship to the supporting member so that they can swing downwards into a position in which they are substantially parallel to the supporting arms, the pivoting wheels numbering at least three and being located in such fashion as to constitute a stable support for the truck.

3,581,924
DREDGER VESSEL

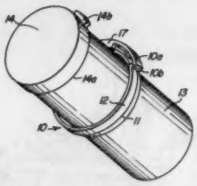
Helmut Marz, Beilstein, Germany, assignor to Erhard Lauster Entwicklungen, Gesellschaft mit beschrankter Haftung, Neckartalstrasse, Stuttgart-Bad Cannstatt, Germany

Filed Jan. 13, 1969, Ser. No. 790,526
Claims priority, application Austria, Jan. 17, 1968, A471/68
Int. Cl. E02f *3/46*
U.S. Cl. 214—767 6 Claims



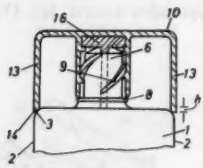
A dredger vessel for use in connection with a dredger boom which comprises a first tiltable means composed of two sidewalls and a bottom wall and also comprises a second tiltable means composed of a wall member extending transverse to said two sidewalls and having a bottom surface movable over the bottom wall of said first tiltable means while said first and second tiltable means are pivotable relative to each other so that the second tiltable means when occupying one of its extreme positions is located outside of and in angularly spaced relationship to the respective adjacent working edge of said first tiltable means when the latter occupies its respective end position remote from said second tiltable means.

3,581,925
SAFETY LATCHING RING FOR CYLINDRICAL CONTAINERS
Theodore Wayne Thornton, and George M. Thornton, both of Salt Lake City, Utah, assignors to Thornton Manufacturing Company, Salt Lake City, Utah
Filed June 9, 1969, Ser. No. 831,494
Int. Cl. A61j 1/00; B65d 55/02; B65j 41/08
U.S. Cl. 215—9 9 Claims



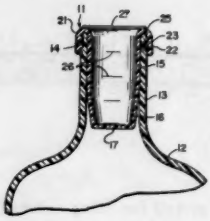
A latching ring for medicine vials and the like to prevent opening of such vials by young children. A ring is preferably molded from a plastic material for slipping onto a standard cylindrical vial from the bottom thereof to receive and latch the usual laterally projecting grasping tab of the standard snap-on cover for such a vial when either such cover or the vial is rotated in an appropriate direction relative to the other. Depression of a resiliently formed and difficult-of-access latching member, positioned in a tab-receiving enlargement of the ring, effects unlatching and permits rotation of either cap or ring in the opposite direction to release the ring from the cap and to enable the ring to drop down from the cap and permit normal opening of the vial.

3,581,926
CLOSURE CAP FOR CONTAINERS
Eberhard Roder, 2400 Lubeck, Schwartauer Allee 1, Germany
Filed Apr. 25, 1969, Ser. No. 819,303
Claims priority, application Germany, Apr. 25, 1968, P 17 57 325.0
Int. Cl. B65d 1/02, 41/04
U.S. Cl. 215—41 6 Claims



A closure cap of resilient material having a circumferential shape corresponding to that of the upper portion of a container, such as a bottle having a neck portion projecting from a shoulder surface of the container and defining the container opening which is sealed by the closure cap when it is brought into releasable closing position by snap action in which the side surfaces of the container and of the closure cap are aligned, wherein the neck portion of the container is provided with outer courses of thread while the closure cap includes an inner tubular socket provided with corresponding inner courses of thread, the pitch and the position of the courses of thread being such that the side surfaces of the courses of thread being such that the side surfaces of the closure cap occupy an angular position relative to the side surfaces of the container, when the closure cap has been rotated until its lower edges contact the shoulder of the container whereupon continued rotation out of said angular position causes a deformation of and a storage of force in the sidewalls and/or the top wall of the closure cap which force is released when the lower edges of the closure cap snap over the rounded or beveled shoulder edges of the container into a closing position beveled shoulder of the closure cap in which the sidewalls of the closure cap and the sidewalls of the container are positively aligned.

3,581,927
CONTAINER CLOSURE
Arthur J. Langdon, East Hampton, Conn., assignor to Edward Weck & Company, Inc., Long Island, N.Y.
Filed Sept. 23, 1968, Ser. No. 761,525
Int. Cl. B65d 41/04, 39/08
U.S. Cl. 215—43 2 Claims

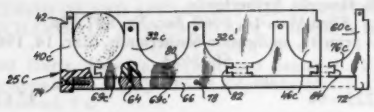


A container closure having the convenience of a screw cap and the sealing properties of a cork while being capable of measuring the material in the container. The closure is cup-shaped having a lip with screw threads to mate with the threads on the bottle neck. The cup extends into the neck of the bottle in an upright orientation.

3,581,928
HANGER CONSTRUCTION FOR MEDICAL LIQUID CONTAINER
Elmer F. St. Amand, Hollywood, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Oct. 14, 1968, Ser. No. 767,354
Int. Cl. B65d 23/10
U.S. Cl. 215—100A 2 Claims

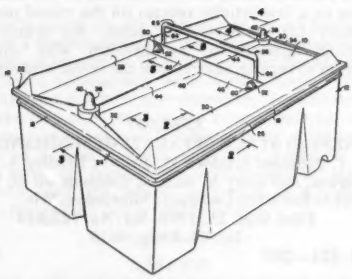
A plastic medical liquid container with a hinged hanger integrally connected to the container at an indented recess in the container's bottom wall. This hanger has an aperture and snaps into an undercut wall section of a lug which is spaced between two legs of the container, thus keeping the hanger tucked into the recess when the plastic container sits on a flat surface. To provide structural strength to the container, the legs are convexly curved and smoothly blend into the indented recess which is in the form of concave arch.

3,581,929
DIAMOND DRILL CORE TRAYS
Edward Franklin Guenard, 2210 Barbara Avenue, and Lionel A. Chretien, 710 Ridgeview Terrace, both of Kamloops, British Columbia, Canada
Filed Apr. 23, 1969, Ser. No. 818,684
Int. Cl. B65d *25/04, 25/10, 1/36*
U.S. Cl. 220—22 5 Claims



Trays adapted for supporting cylindrical mineral earth cores have cylindrically curved compartments with parallel flutes to support the cores laterally and underneath. Trays are made partially or entirely of plastic material. They may be made in different colors. Trays can be made of individual rails interlocked with each other and with an underlying baseboard. Covers fit snugly on trays which have rabbeted sidewalls.

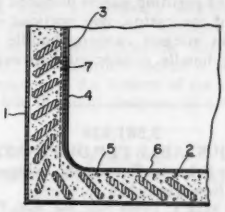
3,581,930
THERMAL FORMED PLASTIC COVER FOR BULK MILK CONTAINERS
Harry J. Gunnink, 12643 North 30th Drive, Phoenix, Ariz.
Filed Jan. 16, 1969, Ser. No. 791,652
Int. Cl. B65d *47/10, 43/08, 25/28*
U.S. Cl. 220—72 3 Claims



A thermal formed plastic cover for bulk milk containers particularly for use in connection with the upper open ends of rectangular bulk milk containers; the cover being thermal formed of a single thin sheet of plastic, such as polystyrene, and having four edges adjacent to which thermal formed reinforcing channels are disposed and extended in offset relation to the plane of the sheet so as to provide a lightweight economical cover which has sufficient strength to support a handle for carrying the container full of liquid.

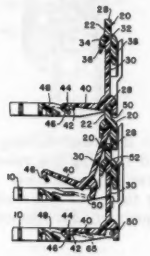
3,581,931
STORAGE TANK OF COLD LIQUEFIED GAS
Katsuro Yamamoto, Tokyo, Japan, assignor to Bridgestone Liquefied Gas Company Limited, Tokyo, Japan
Filed Nov. 25, 1969, Ser. No. 879,841
Claims priority, application Japan, Nov. 30, 1968, 43/87390
Int. Cl. B65d *25/18*
U.S. Cl. 220—9LG 13 Claims

A storage tank of cold liquefied gas, which comprises an outer shell, an inner membrane tank, and a heat-insulating layer inserted between the outer shell and the inner membrane tank. The heat-insulating layer consists of a body made of first material and blocks made of second material buried in the body. Thereby, excellent mechanical strength and heat



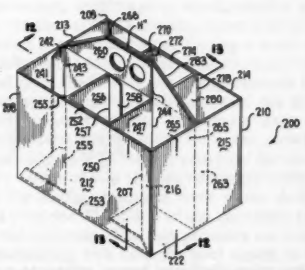
insulation can be achieved with a comparatively thin heat-insulating layer.

3,581,932
NEST AND STACK CONTAINERS
Elsmer W. Kreeger, Orchard Lake, and Ellsworth E. Sanders, Birmingham, both of, Mich., assignors to Pinckney Molded Plastics, Inc., Pinckney, Mich.
Filed Apr. 29, 1969, Ser. No. 820,104
Int. Cl. B65d *21/04, 21/06;* A47f *3/14*
U.S. Cl. 220—97 12 Claims



The disclosure is of a container adapted either to nest or to stack with other containers of the same construction. Each of two opposite sidewalls has means providing a seat spaced above the bottom wall, and also has a side panel provided with a foot. The seats of the container are adapted to support the feet of an upper container of identical construction in stacked relation when the panels are vertical. The panels can be moved to a different position such that the feet clear the seats of a lower container for nesting.

3,581,933
BOTTLE CARRIER
Arnold Bernard Engdahl, Jr., Stanton, Calif., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Nov. 12, 1968, Ser. No. 774,950
Int. Cl. B65d *75/00*
U.S. Cl. 220—113 24 Claims



This disclosure relates to a bottle carrier or carton which is formed of a composite blank formed of two or three separate

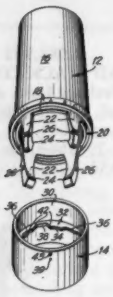
pieces and a separate or integral carrying handle, the carrier including a partition setting off a plurality of article-receiving compartments, the partition including a partition wall defined by a pair of partition panels disposed along a longitudinal centerline of the carton, and portions of the partition panels defining an integral carrying handle or including a separate carrying handle connected between the partition panels.

3,581,934

ADJUSTABLE CUP DISPENSER

Anthony Salvatore Sciascia, Easton, Pa., assignor to American Can Company, New York, N.Y.

Filed May 1, 1969, Ser. No. 820,799
Int. Cl. A47f *1/04*; G07f *11/16*
U.S. Cl. 221—304 **11 Claims**



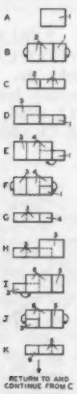
An adjustable cup dispenser having a minimum of parts, namely an elongated housing for receiving a stack of cups and a control sleeve cooperatively associated therewith, which provide ready support for a stack of cups and also effect positive size adjustment for supporting stacks of varying cup sizes.

3,581,935

PROCESS FOR FOLDING SHEET MATERIAL AND PACKAGED DISPENSERS THEREFOR

Tzu-Chiang Chi, Columbia, Mo., assignor to William I. Andress, Kirkwood, Mo., a part interest

Filed May 14, 1968, Ser. No. 729,023
Int. Cl. B65g *59/00*
U.S. Cl. 221—1 **6 Claims**



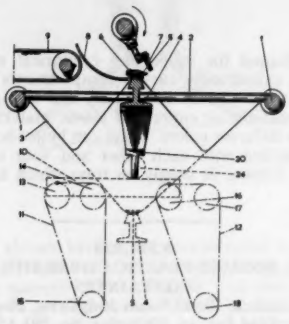
The invention disclosed herein relates to a unique method for folding sheet material for serial extraction from packaged dispensers involving a series of longitudinal and transverse folds of superimposed sheets of paper, cloth or other flexible material. Packaged dispensers of various shapes and containing supplies of such folded products for serial extraction thereof through apertures of varying geometrical configuration are provided.

3,581,936

APPARATUS FOR ISOLATING ARTICLES FROM A SUPPLY

Hendrikus Gerhardus Muller, Hengelo (O), Netherlands, assignor to N. V. Machinefabriek B & S Bedrijven v.d. Woerdt, Hengelo, Netherlands

Filed Mar. 14, 1969, Ser. No. 807,224
Claims priority, application Netherlands, Mar. 14, 1968, 6803633
Int. Cl. B65d *83/00*
U.S. Cl. 221—64 **17 Claims**



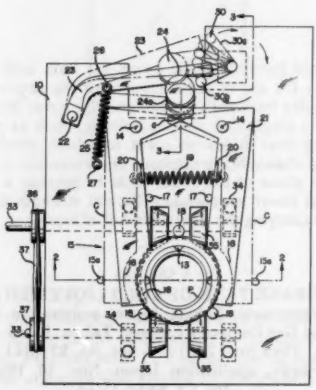
Articles such as shrimps are isolated from a supply contained in a hopper whose bottom is a flexible multiperforate sheet. A member raises the central area of the sheet so that only one or a few articles remain on the raised portion and the others fall away to the sides. An article transfer mechanism operates in synchronism with the raising mechanism to receive and remove the raised articles.

3,581,937

NESTED STACK SEPARATING MECHANISM

Robert T. Johnson; Gaylord W. Brown; Bradley A. Schnepp, Beaverton, and Gary A. Adams, Coleman, all of, Mich., assignors to Koehring Company, Milwaukee, Wis.

Filed Sept. 25, 1968, Ser. No. 762,424
Int. Cl. B65g *59/10*
U.S. Cl. 221—290 **13 Claims**



Mechanism for separating individual, tapered rimless container parts in timed sequence from a vertical stack of such

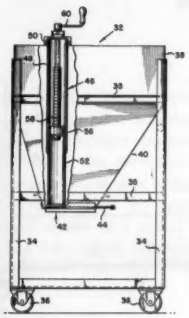
parts and wherein separable support fingers underlie the peripheral edge of the lowermost part and a continuously revolved actuator controls a spring-powered striker member which is periodically released to engage the fingers with sufficient momentum to spread them enough to let the lowermost part fall beyond the fingers which are then immediately returned to original position to underlie and receive the also descending next lowermost part.

3,581,938

METHOD OF AND APPARATUS FOR INITIATING THE DISCHARGE OF A FOOD PRODUCT FROM A HOPPER CONTAINER

Gerald Hartz, Henrico County, and James L. Hutcheson, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Nov. 5, 1968, Ser. No. 773,565
Int. Cl. B67b *7/00;* **B67g** *3/12*
U.S. Cl. 222—1 **8 Claims**



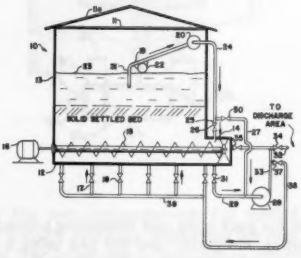
In order to overcome the tendency of a food product from clogging in a funnel-shaped bottom discharge opening, a hollow cylindrical or tubular flow control member has its lower end positioned substantially immediately above a trap door closure member for a hopper container. Immediately after opening the trap door, the tubular control member is raised thereby creating a pocket or volumetric void which facilitates discharge of a food product within the container. In the preferred form, the tubular flow control member telescopes within itself, and the hopper container is elevated with respect to the ground and is made portable.

3,581,939

METHOD AND APPARATUS FOR STORING A SOLID-LIQUID SLURRY

Frank L. Meyer, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed July 18, 1969, Ser. No. 842,937
Int. Cl. B67b *7/00*
U.S. Cl. 222—1 **8 Claims**



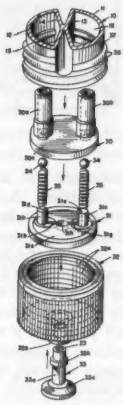
A method and apparatus for storing a solid-liquid slurry in a stationary tank having agitation means at the bottom of the tank for agitating solid components of the slurry which settle to the bottom thereof. The liquid components of the slurry settle on the top of the solid components and are withdrawn from the tank while a relatively solids-free liquid is introduced into contact with the agitation means so as to fluidize any solid components of the slurry surrounding the agitation means. The agitation means is actuated to agitate the solid components at the bottom of the tank and the slurry is withdrawn while the solid components are in suspension.

3,581,940

MULTIPLE COMPARTMENT DISPENSER CONTAINER WITH CHECK VALVES

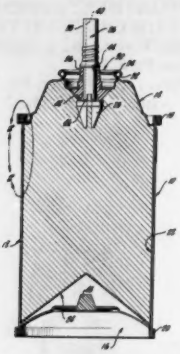
John A. Cella, Lake Forest, Ill., assignor to Alberto-Culver Company, Melrose Park, Ill.

Filed Nov. 12, 1968, Ser. No. 774,803
Int. Cl. B65d *35/22*
U.S. Cl. 222—94 **7 Claims**



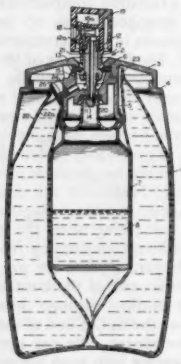
The invention relates to a dispenser container for separate storage and proportioned mixed dispensing of two interacting fluid components. The combination comprises a tubular container of flexible material (plastic or plastic laminate preferred) having central wall means providing two collapsible longitudinally extending compartments. The container is constructed and arranged so as to produce substantially equal internal pressures in both compartments whenever it is grasped by a hand. The outer walls of the container compartments are simultaneously and equally collapsed toward a central plane, thereby correspondingly reducing the volume of both compartments and creating equal internal pressures therein. The container tapers from the outlet end toward the closure end which is preferably sealed along a transverse line lying substantially in the longitudinal plane toward which the outer walls collapse. Preferably the compartments have approximate cross sections of half ellipses with the inner wall means generally coinciding with the major axes and the minor axes progressively shortening from the outlet end to the closure end. Separate ports are provided for each compartment at the outlet end of the container and outlet check valves control the outflow through these ports. A dispenser cap is received over the outlet end of the container enclosing the ports and valve means. The cap provides an intermixing passage communicating with both the port means at its inner end when the valves are open and its outer end with a dispensing outlet; and; intermediately, means are preferably provided for promoting through intermixing of the two fluids being dispensed.

3,581,941
PRESSURIZED CONTAINER
John K. Bruce, and Theodore R. Bruce, both of Burbank, Calif., assignors to Sterigard Company, Burbank, Calif.
Continuation of application Ser. No. 697,857, Jan. 15, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 548,963, May 10, 1966, now Patent No. 3,393,842. This application Sept. 26, 1969, Ser. No. 861,513
Int. Cl. B67d *5/38*
U.S. Cl. 222—95 **4 Claims**



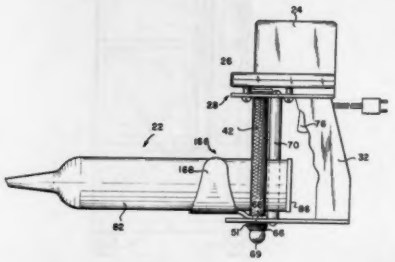
The pressurized container has a cylindrical rigid body closed at its top and bottom. A flexible, elastic bag is disposed within the container with its top clamped by a seam formed between the body and a covering cap. The flexible bag has a sealed end proximate the bottom of the body which is arched, with the apex of the arch being at the centerline of the body and with the arch's sides extending down towards the bottom of the body. The space between the bottom of the container and the arch provides a volume for charging the container with a propellant. A dispensing valve is attached to the cap in communication with the interior of the bag on the other side of the propellant chamber.

3,581,942
FILLING AND EMPTYING MEANS AND SPACING MEANS FOR A FLEXIBLE SAC FOR HOLDING A PRODUCT TO BE DISPENSED
Marvin L. Thornton, Bayside, N.Y., assignor to Geigy Chemical Corporation, Greenburgh, N.Y.
Filed Apr. 3, 1969, Ser. No. 813,212
Int. Cl. B65d *35/28*
U.S. Cl. 222—95 **8 Claims**



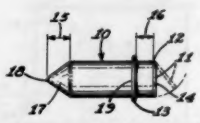
A filling and emptying means for a flexible sac for holding a product to be dispensed. The means comprises a nozzle having a tubular member with a flange on one end. Said tubular member extends through the wall of said flexible sac with said flange in sealing engagement against the inside of the wall of said flexible sac. The tubular member has a bore therethrough. A body with which the sac is associated has a bore therein for receiving said tubular member. A rod-shaped spacer is positioned in the end of said bore at said flange and projects out of the bore in the direction opposite the direction in which said tubular member projects from said flange. The free end of said rod-shaped spacer keeps the wall of the sac opposite said flange away from the bore during aspiration of the contents of the sac through said nozzle.

3,581,943
ASSEMBLY FOR DISPENSING VISCOUS MATERIALS
Gerald A. Koenigshof, 101 Wall St., Rockville, Md., and John P. Widener, 6 North Summit Drive Apt. 101, Gaithersburg, Md.
Filed Apr. 23, 1969, Ser. No. 818,592
Int. Cl. B65d *35/28*
U.S. Cl. 222—102 **5 Claims**



An assembly for dispensing viscous materials which includes a pair of spaced, vertically arranged rollers, at least one of which rollers is driven, either mechanically or electrically. A tubular single or multiple celled cartridge having flexible walls containing one or more viscous materials which is to be dispensed is fed between the two rollers. A nozzle is provided at one end of the cartridge whereby, when the flexible walls of the cartridge are forced towards each other by the rollers, the viscous material is forced through the nozzle of the cartridge in a mixing or extruding action for use. Release mechanism is provided for moving one of the rollers in a direction away from the other roller to permit ready removal of the cartridge.

3,581,944
PACKAGING AND SINGLE APPLICATION DISPENSING DEVICE
Richard F. Jeppesen, 2302 N. 27th St., Phoenix, Ariz.
Filed July 24, 1968, Ser. No. 747,386
Int. Cl. B65d *35/44*
U.S. Cl. 222—107 **1 Claim**

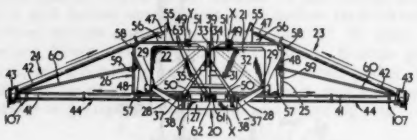


A device for packaging and dispensing creamlike materials such as butter, margarine and the like using a compressible collapsible member having a flap formed across one end thereof and an anchor ridge around the collapsible member at a predetermined spaced distance in from the flap to facilitate manipulation and operation of the dispensing device.

3,581,945
APPARATUS FOR DISTRIBUTING MATERIAL ONTO THE GROUND

William Lawrence Savage, Stamford, England, assignor to Blackstone & Company Limited, Stamford, England

Filed June 12, 1969, Ser. No. 832,789
Claims priority, application Great Britain, June 12, 1968, April 1, 1969
Mar. 1, 1969, 27823/68;11049/69;16873/69
Int. Cl. B67d *1/16*
U.S. Cl. 222—109 11 Claims

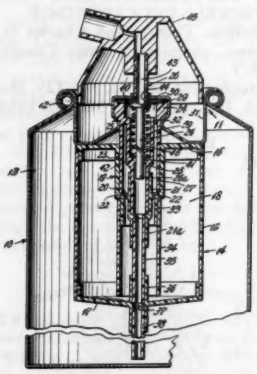


Distributing apparatus for distributing particulate material, for example fertilizer, on the ground includes a mobile frame and a recirculatory conveyor system mounted on the frame and extending transversely of the direction of travel of the apparatus. The material is carried in a hopper on the frame and the material is conveyed from the hopper along a first conveyor with discharge outlets to a return conveyor which conveys material back to the hopper. The conveyor system is pivotable from an operative into an inoperative position.

3,581,946
AEROSOL PACKAGE

Philip Meshberg, 15 Stoneleigh Road, Fairfield, Conn.

Filed Apr. 22, 1969, Ser. No. 818,376
Int. Cl. B65d *35/22, 35/28*
U.S. Cl. 222—136 8 Claims

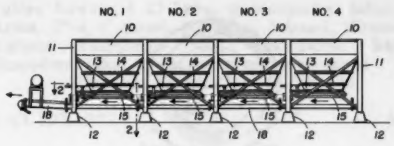


The device has two compartments for storing different materials and a single valve for dispensing the two materials simultaneously. The construction provides an effective means whereby either or both compartments can be readily filled with the material before assembly and both can be quickly charged after assembly through the valve, with the required propellants.

3,581,947
LINEARIZED GATE CONTROL SYSTEM FOR MULTIPLE FEEDER AND HOPPER ARRANGEMENTS

Wayne D. Jacobson, Cedar Rapids, Iowa, assignor to Iowa Manufactring Company, Cedar Rapids, Iowa

Filed Jan. 27, 1969, Ser. No. 793,962
Int. Cl. B67d *5/60*
U.S. Cl. 222—76 5 Claims

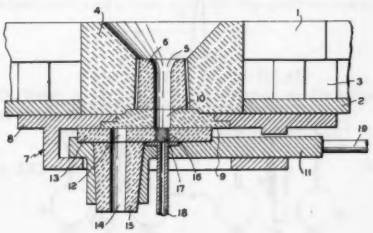


A linearized gate control for multiple hopper-feeders of the cold feed system of an asphalt plant is disclosed. Each hopper includes a cam, driven by a position servomotor, which opens or closes the gate governing the flow of aggregate from the hopper to its feeder, the latter being driven at a constant speed. The cam is profiled so that equal increments of motor shaft rotation produce equal increments of gate opening. The servomotors of all hoppers are connected into an electrical bridge circuit such that, after the respective proportionate openings of the gates are initially established by the setting of individual electrical controls for the gate motors, adjustment of a single master control to produce a certain percentage increase or decrease in the total aggregate delivered from all the hoppers will also increase or decrease the opening of each gate by the same percentage, as the case may be.

3,581,948
SLIDING GATE OF A CASTING LADLE FOR POURING LIQUID METALS

Pol Detalle, Nancy-Villers, France, assignor to Interstop AG, Zug, Switzerland

Filed Aug. 11, 1969, Ser. No. 849,046
Int. Cl. B67d *1/08*
U.S. Cl. 222—148 8 Claims



A sliding gate for a casting ladle provided with a bottom lip, for pouring liquid metals, particularly steel, composed of a fireproof plate provided with an aperture to be firmly set under the bottom of the ladle by means of a metal frame piece, and a further refractory shutter plate provided with an outlet, set on a metal sliding piece which slides on the first plate and is slidably set in the rigid frame piece. A sliding shutter is provided with an installation which will allow the prevention and/or the elimination of the solidification of the melt in the discharge canal of the casting ladle, particularly in the aperture of the firmly set plate of the sliding shutter.

3,581,949

CONTROLLED VOLUMETRIC FEEDING APPARATUS

Lucas Jones Conrad, and Jesse Randolph Pinkham, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 12, 1968, Ser. No. 775,004
Int. Cl. B67d 5/64
U.S. Cl. 222—167 8 Claims

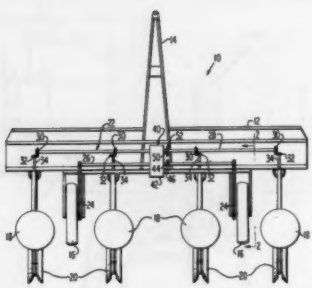
An apparatus for feeding a supply of a multiple element material at a controlled volumetric rate comprising a drum mounted for rotation about an inclined axis with a large intake opening at its raised end and a feed scoop and discharge spout mounted on a removable discharge head on its lower end. As the drum rotates, longitudinal bars located on its inner surface near the discharge end keep the feed material tumbling and the feed scoop passing through the mass of material lifts a measured amount upwardly dumping it by gravity into the discharge spout. The discharge spout and its cooperating semicircular opening are axially offset on the head permitting the use of a larger spout for a given drum size and the lip of the intake opening is arranged to be lower than the upper edge of the discharge spout to prevent uncontrolled discharge of the material through the spout in the event of overfeeding of the drum.

3,581,950

VARIABLE SPEED DRIVE MECHANISM FOR SEED PLANTERS

Kenneth W. Miller, P.O. Box 206, Littlestown, Pa.

Filed June 13, 1969, Ser. No. 832,888
Int. Cl. B67d 5/64
U.S. Cl. 222—177 5 Claims



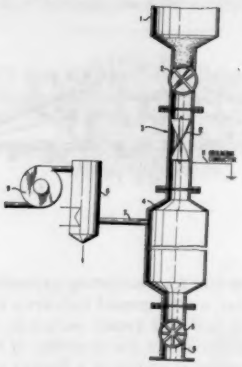
The invention is a variable speed drive mechanism for a seed planter of the type having a rotatably driven seed dispenser, a ground-engaging wheel and a power transmission means drivingly connecting the wheel to the dispenser for driving the dispenser. The mechanism includes a plurality of selectively engageable drive trains connected to the transmission means and interposed between the wheel and the dispenser. The drive trains are operable to drive the dispenser at different velocities with respect to the rotational velocity of the wheel.

3,581,951

APPARATUS FOR THE DEGASSING OF FINE-GRANULAR SUBSTANCES

Fritz Sutter, and Wilhelm G. Weber, both of Pratteln, Switzerland, assignors to Buss AG, Basel, Switzerland

Filed Jan. 15, 1969, Ser. No. 791,432
Claims priority, application Switzerland, Feb. 26, 1968, 3018/68
Int. Cl. B67d 5/58
U.S. Cl. 222—190 2 Claims



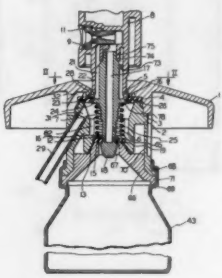
The present invention relates to an apparatus for the degassing of fine-granular substances, which apparatus incorporates a vertically mounted cylindrical degassing chamber with tapering conical ends to the upper end of which a material infeed and dosage element with filler hopper and subjoined gravity tube intermediate piece is connected and to the lower end of which a pressure-sealed cell-type lock is connected, the degassing chamber being connected to a vacuum pump with a condensation separator.

3,581,952

PLUG VALVE ASSEMBLY FOR FLUID PRODUCT DISPENSER HAVING RETAINING RING SUPPORTING A PROPELLANT CARTRIDGE

Jean Marand, Poitiers, France, and Charles D. Chambers, Huntington, Conn., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

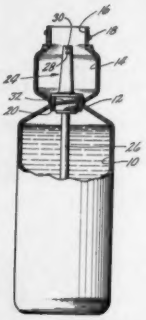
Continuation of application Ser. No. 716,129, Mar. 26, 1968, now abandoned. This application May 22, 1969, Ser. No. 830,198
Int. Cl. B67d 5/14
U.S. Cl. 222—193 6 Claims



A plug valve assembly for dispensers of fluid products adapted to be attached to a product container for containing the fluid product to be dispensed and adapted to accommodate a propellant cartridge within the product container, said plug valve assembly comprising a hollow valve stem, a pushbutton actuator on the upper end of said stem and hav-

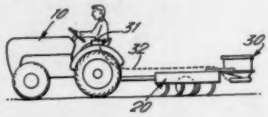
ing a nozzle therein communicating with said hollow stem, a cap member adapted to fit over a product container and having an aperture therein through which the hollow stem is movable, a support secured to the underside of said cap and having a hollow central portion through which said hollow stem is movable, a dip tube secured in said support and opening into said hollow interior, a fluid product flow path through said hollow stem exteriorly of the hollow thereof from a point adjacent said hollow interior, a first flexible gasket means in said assembly through which said hollow stem passes obturating said fluid product flow path between said fluid product flow path and said hollow interior, said support having a downwardly open recess therein, a second flexible gasket means in the bottom of said recess through which said hollow stem passes, said hollow stem having an aperture therein opening into the hollow of the stem, said aperture being obturated by said second flexible gasket means, and a retaining ring holding said second gasket means in said recess and secured to said support, and a propellant cartridge in gastight relationship to said retaining ring.

3,581,953
REFILLABLE LIQUID DISPENSER
Robert J. Donoghue, 900 Windsor Ave., Windsor, Conn.
Filed Feb. 19, 1969, Ser. No. 800,456
Int. Cl. B65d *39/08*
U.S. Cl. 222—207 **5 Claims**



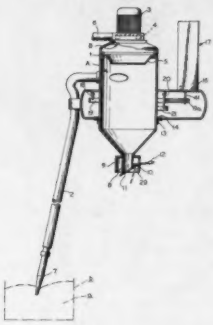
A flexible walled container has first and second integrally formed chambers arranged one above the other, with an integrally formed separating wall therebetween. A tubular plug is threadably received in an insert fixed in an opening defined by said separating wall, and access to the plug is provided through a dispensing opening in the upper or second chamber. The plug carries a tube or conduit through which liquid can be forced by squeezing the lower or first chamber defining portion, and the plug has a laterally open passageway for directing the liquid toward the side of the second chamber to permit filling of the latter to a desired level after which the container can be inverted to dispense only that liquid in said second chamber.

3,581,954
MEASURING AND DISPENSING APPARATUS
Wilfred Prentice, Assiniboid, Saskatchewan, Canada
Filed Mar. 18, 1969, Ser. No. 808,098
Claims priority, application Canada, Mar. 22, 1968, 015,614
Int. Cl. G01f *11/10*
U.S. Cl. 222—361 **9 Claims**



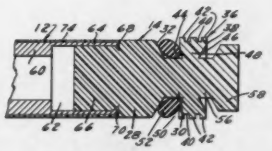
A metering and dispensing apparatus detachably mounted on a hopper converting the latter to a dispenser. The hopper is detachably mounted on a farm implement for selectively dispensing poisons to irradicate rodents. The metering and dispensing element includes a mounting plate with a measuring and dispensing element movably mounted by apparatus remotely controlled.

3,581,955
MEANS FOR SUPPLYING PULVERIZED PLASTIC ELEMENTS
Teruhiro Kawata, I 27-2-cho, Kasumigaoka, Sakai; Yojiro Arata, 27-4, C-chomi, Nakaburi, Minami, Hirokota, and Katumi Tokoyama, 513, Naka-2-cho, Ishizu-cho, Hamadera, Sakai, all of Osaka Prefecture, Japan
Filed Jan. 8, 1969, Ser. No. 789,689
Int. Cl. B67d *5/40*
U.S. Cl. 222—373 **5 Claims**



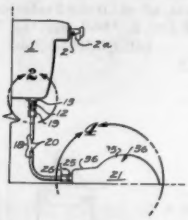
Apparatus for dispensing accurately measured pulverized material from a storage bin to another location, comprising a weighing hopper attached to a weighing scale, a vacuum pump, and a feed pipe capable of picking up the pulverized material under the suction force provided by the vacuum pump and feeding the material to the hopper until a predetermined amount is determined by the scale, whereupon either manually or automatically, the feeding is stopped and a door is opened at the bottom of the hopper by force of gravity acting upon the stored matter to release the material after which the door closes and the sequence is repeated.

3,581,956
SYRINGE PLUNGER HEAD
John D. Reid, Monrovia, Calif., assignor to Hamilton Company, Whittier, Calif.
Filed Sept. 26, 1968, Ser. No. 762,838
Int. Cl. A61m *5/00*
U.S. Cl. 222—386 **9 Claims**



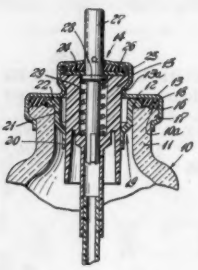
Syringe apparatus having a plunger head with a peripherally grooved flange urged against the interior wall of the syringe by a resilient O-ring wedged in an annular groove in the head.

3,581,957
OPERATOR FOR LIQUID DISPENSERS
Herbert S. McCray, Mission Hills, Calif., assignor to The Bobrich Corporation, Los Angeles, Calif.
Filed Jan. 22, 1969, Ser. No. 793,097
Int. Cl. B67d 5/06
U.S. Cl. 222—505 3 Claims



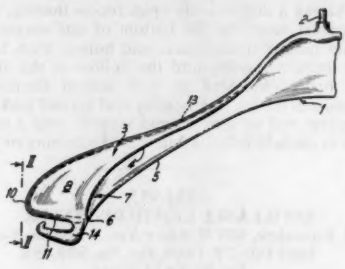
An operator for liquid dispensers, particularly liquid soap, which is capable of hand, foot or other remote operation to cause discharge from a single nozzle; the foot operator utilizing a tube adjacent the inlet end of the dispensing tube which is squeezed by a plunger moved by a slide rod within a control cable; the slide rod in turn being operated by the reciprocal end of a foot-engaged leaf spring.

3,581,958
SEAL-ISOLATING MEANS FOR SEALED CONTAINERS
Philip Meshberg, 15 Stoneleigh Road, Fairfield, Conn.
Filed June 11, 1969, Ser. No. 832,209
Int. Cl. B67d 3/00
U.S. Cl. 222—542 6 Claims



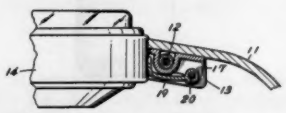
A container having an opening to be closed and sealed by a closure member and sealing means and having means within the container for isolating the sealing means from the contents of the container. If the closure includes an aerosol-dispensing valve, it, too, is provided with means to isolate the valve-sealing means from the contents of the container. If the container is of metal and has a bead around the opening, the isolation means reinforces the bead during the application of the closure to the container.

3,581,959
CLOTHES HANGER
Joachim Niehenke, Hameln/Weser; Herbert Seckelmann, Wahlen, and Max Hubner, Kaufbeuren-Neugablonz, all of, Germany, assignors to Sinram & Wendt, Hessisches Kunststoff Werke Schlerf & Co., Hameln/Weser and Max Hubner, Kaufbeuren-Neugablonz, Germany
Filed Jan. 16, 1969, Ser. No. 791,747
Claims priority, application Germany, Jan. 25, 1968, S63810
Int. Cl. A41j 51/08
U.S. Cl. 223—88 8 Claims



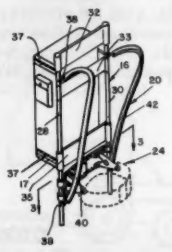
A plastic clothes hanger with two hollow arms which taper toward their tips.

3,581,960
DEVICE FOR CONNECTING A BRACELET TO A WRIST WATCH
Tsuneo Ojima, 34, Naka-machi, Itabashi-Ku, Tokyo, Japan
Filed Mar. 21, 1969, Ser. No. 809,090
Claims priority, application Japan, Mar. 28, 1968, 43/23,862
Int. Cl. A44c 5/00
U.S. Cl. 224—4 4 Claims



A watch bracelet for wristwatches having a spring-bar holding assembly connected to the watch by a spring-bar. The assembly is provided with a pivoted brace arm movable against the watchcase to urge the bracelet portion against the surface of the watchcase and provide an effectively continuous surface area between watchcase and watch.

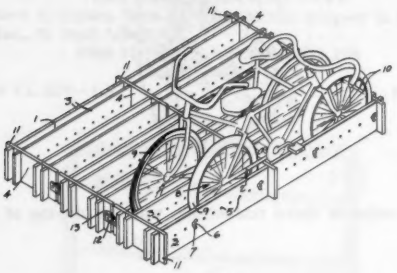
3,581,961
ADJUSTABLE PACK FRAME ASSEMBLY
Jimmie L. Owens, 4426 Kailer Drive, Wichita, Kans.
Filed Apr. 1, 1969, Ser. No. 811,974
Int. Cl. A45f 3/10
U.S. Cl. 224—25 4 Claims



This invention is a pack frame assembly adapted to be carried upon a person's back through the use of shoulder straps

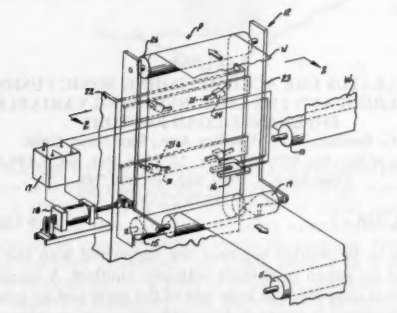
and having hip-engaging means thereon to bear on a portion of the person's hips so as to carry the majority of the load thereagainst. More particularly, this invention is a pack frame assembly adapted to carry packs, sleeping rolls, or the like having hip-engaging means which are readily adjustable so as to be readily carried by anyone while placing the majority of the load upon one's hips through the use of an interconnected belt member.

3,581,962
AUTOMOBILE BICYCLE CARRIER
George M. Osborn, 275 Center St., San Rafael, Calif.
Filed Oct. 22, 1969, Ser. No. 870,483
Int. Cl. B60r *9/04*
U.S. Cl. 224—42.1 **6 Claims**



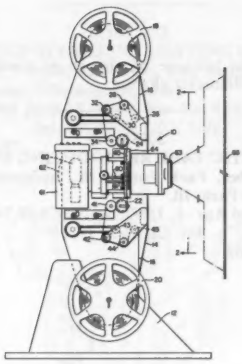
A bicycle rack made of several detachable connected sections, each section being made of a longitudinal board connected at the ends by cross boards, and so spaced that the wheels of the bicycle can be placed between each pair of longitudinal boards. The boards are resiliently flexible so that a bolt in front and in back of each bicycle wheel can be tightened to press the boards against the opposite sides of the wheel thereby to securely hold the bicycle in place although the height of the boards is such that it extends only to about the point where the spokes begin to diverge outwardly from the plane of the tires. The bicycles are deposited in the slots so that the positions of adjacent bicycles are reversed, namely the handlebars of one bicycle are adjacent the seat of the next bicycle. The bicycles are deposited in the assembled rack on the ground then the sections are detached and each section is separately placed upon the usual automobile top carrier frame and when all the sections are in position they are again secured together and at the four corners of the assembled unit suitable clamps attach the entire unit to the top carrier frame.

3,581,963
WEB GUIDE APPARATUS AND METHOD
Robert D. Rule, Rockford, Ill., assignor to Rockford Servo Corporation, Rockford, Ill.
Filed Feb. 14, 1969, Ser. No. 799,197
Int. Cl. B65h *25/26*
U.S. Cl. 226—3 **9 Claims**



A web guide apparatus and method in which the lateral position of a traveling web passing over a tiltable web guide roller is sensed at a location in advance of the tiltable web guide roller and the web leaving the tiltable web guide roller is caused to double back to a point adjacent a plane through the web edge-sensing location and normal to the plane of tilting movement of the web guide roller. The web is guided so as to enter the tiling web guide roller in a plane generally paralleling the plane of motion of the web guide roller.

3,581,964
FILM TRANSPORT MECHANISM
Francis A. Betron, Kettering, and Roger W. Morin, Waynesville, both of, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Mar. 26, 1969, Ser. No. 810,602
Int. Cl. G03b *1/24*
U.S. Cl. 226—33 **2 Claims**

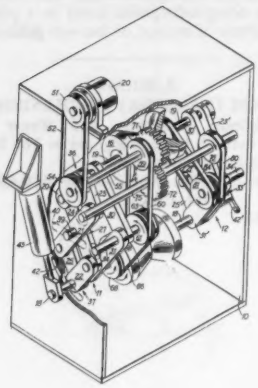


A transport mechanism for use with either perforated or nonperforated film during its intermittent travel through a camera, projector, or like film-handling machine wherein the mechanism includes means for momentarily slowing the speed of the film prior to stopping the film. The perforated film embodiment utilizes sprocketed rollers for carrying the film, and positioning and detent means for initiating and maintaining control of the film-driving means. The nonperforated film embodiment utilizes clutched rollers for carrying the film, coded film markings, and light means responsive to the position of the film markings during travel of the film for initiating and maintaining control of the film drive means. The speed of the film is reduced from a constant high speed to a constant low speed to enable subsequent stopping at a precise location.

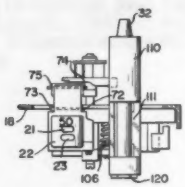
3,581,965
PIPE ALIGNMENT AND DRIVE APPARATUS
Kenneth J. Shaver, Jr., Houston, Tex., assignor to AMF Incorporated, New York, N.Y.
Filed Aug. 28, 1969, Ser. No. 853,639
Int. Cl. B65h *17/18*
U.S. Cl. 226—177 **7 Claims**

Apparatus for engaging an elongated object such as a pipe and maintaining it accurately aligned along an alignment axis as the pipe moves through the apparatus. Apparatus receives pipe of any diameter within a range of diameters. Rollers

which engage opposite sides of pipe are continuously driven from the same power source without need for adjustment of drive mechanism because of change of position of rollers should the pipe diameter change.



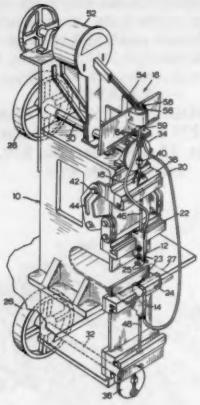
3,581,966
MAGNETIC TAPE REPRODUCING DEVICE
William B. Huber, Park Forest, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Apr. 4, 1969, Ser. No. 839,743
Int. Cl. B65h *17/20*
U.S. Cl. 226—188 **6 Claims**



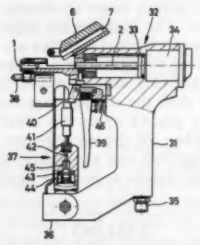
The capstan shaft of a magnetic tape player used to drive the magnetic tape past the tape head is mounted with a thrust bearing in the shaft housing to limit movement of the shaft in an axial direction. A projecting metal portion is cast integral with the capstan housing and extends in a spaced relation to the shaft so that there is a close tolerance therebetween. If the tape becomes bunched up or slack, the projection prevents it from being wrapped around the shaft.

3,581,967
NAILING MACHINE
Cameron R. Benson, Saint John, New Brunswick, Canada, assignor to T. S. Simms & Co. Limited, Saint John, New Brunswick, Canada
Filed Mar. 30, 1970, Ser. No. 23,758
Int. Cl. B27f *7/02*
U.S. Cl. 227—112 **7 Claims**

A nailing machine for simultaneously driving nails into a workpiece from two opposed directions and having a pair of nail chucks, one above the other, a mechanism to bring the chucks together while simultaneously gripping the workpiece between clamping shoes carried by the upper chuck and a work table and an arrangement for feeding nails into the chucks which includes a first tube for delivering nails to the upper chuck by gravity and a second tube for delivering nails to the lower chuck under the influence of air blasts, and a nail pickoff mechanism for dropping nails into the upper end of the tubes in timed relationship with the driving of the nails.



3,581,968
PORTABLE DEVICE FOR DRIVING IN DOWELS
Karl Unger, Alsfeld, Hessen, Germany, assignor to Anton Bilek, Philippsburg, (Baden), Germany
Filed Nov. 1, 1968, Ser. No. 772,539
Claims priority, application Germany, Nov. 2, 1967, P 16 53 026.0
Int. Cl. B25c *1/04*
U.S. Cl. 227—118 **5 Claims**

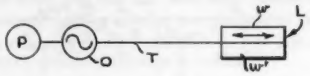


A portable device for driving in dowels comprises a pistol-like grip, a barrel having a slidable striker for ejecting a dowel therein, and dowel feed means associated with the barrel through which the dowels can pass into the ready-for-firing position, the feed means being movable axially of the barrel so that the device can accommodate dowels of differing lengths.

3,581,969
APPARATUS FOR ACCOMPLISHING SONIC FUSION WELDING AND THE LIKE INVOLVING VARIABLE IMPEDANCE LOAD FACTORS
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Division of Ser. No. 537,163, Mar. 24, 1966, Pat. No. 3,439,409
Filed Mar. 6, 1969, Ser. No. 804,798
Int. Cl. B23k *27/00*
U.S. Cl. 228—1 **6 Claims**

Parts to be welded together are supported with the surfaces to be joined in contact with one another. A resonator member is coupled to at least one of the parts and an orbiting mass oscillator is connected to said resonator member. The orbiting mass oscillator is driven at a frequency such as to cause resonant elastic vibration of the associated resonator

member slightly below the peak resonant frequency. The sonic energy is transmitted to the surfaces to be joined,



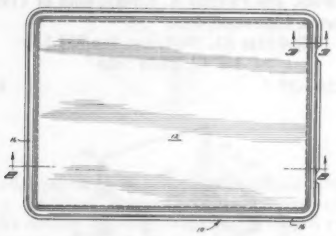
generating heat at such surfaces thereby fusing the parts together.

3,581,970

DISPOSABLE SERVING TRAY

Albert E. Colato, West St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed May 2, 1969, Ser. No. 821,296
Int. Cl. B65d *1/34*
U.S. Cl. 229—1.5 **5 Claims**



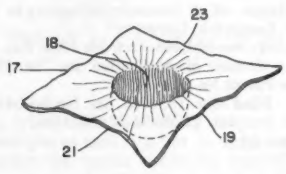
A serving tray including a body formed of a plastic material having a thickness requiring external support including a bottom, the bottom having an upstanding wall extending about the periphery thereof with rib means formed on the outer surface of the bottom together with a flat stiffening member of cardboard positioned upon and in contact with the lower outer surface of the bottom and extending within the rib means and the stiffening member secured upon the bottom by an adhesive.

3,581,971

PACKAGE FOR FROZEN DAIRY DESSERTS

Bernhard A. Zinkgraf, Prospect Heights, Ill., assignor to Kraftco Corporation, New York, N.Y.

Filed Apr. 17, 1969, Ser. No. 817,025
Int. Cl. B65d *1/00;* **A23g** *3/00*
U.S. Cl. 229—3.5 **4 Claims**



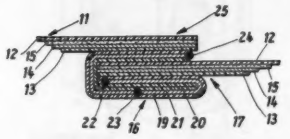
A package for frozen dairy desserts and a method of manufacture of the package are provided. The package is prepared from a sheet of metal foil. The sheet of metal foil has a pocket formed therein which includes extra sheet material and causes an irregular surface inside the package. The shape of the package establishes the shape desired in a finished frozen dairy dessert in a fluid or semifluid condition and the dairy dessert is hardened. The dairy dessert is then readily released from the package by pulling opposite edge portions of the pocket.

3,581,972

PACKAGING CONTAINER WITH PROTECTED OVERLAP SEAM AND METHOD FOR MAKING SAME

Norbert Buchner, Beutelsbach; Adolf Vogele, Magstadt, and Rolf Kohnlein, Korntal, all of, Germany, assignors to Fr. Hesser Maschinenfabrik A.G., Postfach and Stuttgart, Bad Canstatt, Germany

Filed Mar. 4, 1969, Ser. No. 804,181
Claims priority, application Germany, Mar. 7, 1968, P 16 11 933.8
Int. Cl. B65d *3/00, 5/42*
U.S. Cl. 229—4.5 **21 Claims**



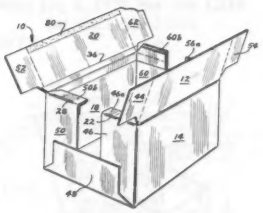
A tubelike packaging container of multilayer material provided with an overlap seam which is protected by a multilayer cover band disposed between the seam margins.

3,581,973

REINFORCED SCORELINE SHIPPING CONTAINER

Charles Henry Turpin, Louisville, Ky., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed June 18, 1969, Ser. No. 834,260
Int. Cl. B65d *5/02, 5/42*
U.S. Cl. 229—37 **12 Claims**



A reinforced paperboard shipping container or baler for enclosing a plurality of articles such as cans is formed from a prescored paperboard blank including four parallel score lines, each reinforced with a narrow strip of a tough sheet material such as a 1-inch wide strip of paper or plastic. A pair of flap scorelines positioned at right angles to the four reinforced scorelines define a plurality of end flaps which when folded over one another form the ends of the container. The end flaps are separated from each other by parallel cuts which are located out of alignment, i.e., laterally of the scorelines that are covered by the reinforcing strips. This produces a plurality of subsidiary flaps integral with the end flaps. The fold line between each of the end flaps and its subsidiary flap is covered by the end portion of one of the reinforcing strips.

3,581,974

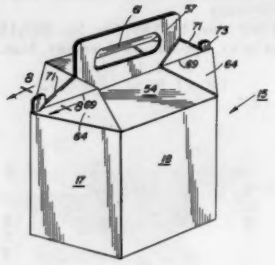
CARTON WITH LOCKED HANDLE AND LID CONSTRUCTION

Claude C. Freeman, Fort Worth, Tex., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 17, 1969, Ser. No. 792,066
Int. Cl. B65d *5/10, 5/46*
U.S. Cl. 229—39 **1 Claim**

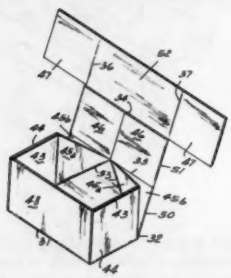
A locked handle and lid construction for a polyhedral shaped carton having an even number of sides in excess of four, and formed from a unitary paperboard blank having hingedly connected panels forming the sides of said carton, a polygonal shaped flap extending from one of said panels and defining a bottom for said carton, a pair of flap extensions from the other end of said panels adapted to be folded in

confronting relationship to define a lifting structure and a top cover, locking tabs extending from other of said panels and



having folds therein to embrace said confronting panels and to be locked thereto.

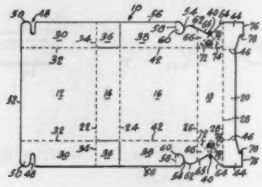
3,581,975
CONVERTIBLE PACKAGE
Katherine Delia Riccio, Chicago, Ill., assignor to Consolidated International Chemical Co. Inc., Chicago, Ill.
Filed June 6, 1969, Ser. No. 830,938
Int. Cl. B65d *5/08;* **A01k** *67/00*
U.S. Cl. 229—33 **5 Claims**



A carton having a compact product storage position which opens up into an enlarged product use position. The carton is formed from a single sheet of fiberboard either plain or corrugated, flexible plastic or the like, slotted and scored to accommodate folding into a small, six-sided, sealed package housing a bag of absorbent ground clay. The box opens up into a large open-topped, closed-bottomed pan with upright sidewalls having free ends sealed by pressure-sensitive adhesive coated zones on the board. The clay product is spread over the bottom of the pan to provide a confined commode area for pets, such as cats.

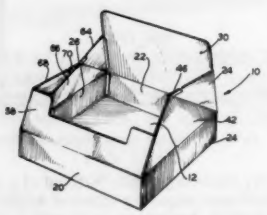
3,581,976
SELF-LOCKING BOX
Norman E. Burgess, Westmount, Quebec, Canada, assignor to Domtar Limited, Montreal, Quebec, Canada
Filed Apr. 2, 1969, Ser. No. 812,599
Int. Cl. B65d *5/22*
U.S. Cl. 229—36 **5 Claims**

A tray comprising, integrally connected, a bottom panel having bottom side panels and a front panel having front side panels, each front side panel being foldably connected at one edge to a bottom side panel and at its opposite edge to a locking panel, a locking flap formed in each of the bottom side panels and fold lines in said front side panels permitting the front panel and bottom side panels to be moved into erected position perpendicular to the bottom panel and the



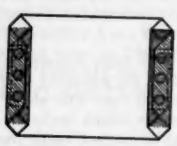
locking flaps to cooperate with the locking panels to secure the panels in erected position.

3,581,977
LITTER BOXES
George Kirsky, and Patricia A. Kirsky, both of 11900 Edgewater Drive, Lakewood, Ohio
Filed May 22, 1968, Ser. No. 731,133
Int. Cl. B65d *5/08*
U.S. Cl. 229—37 **10 Claims**



These litter boxes are designed to provide a container having a unique closure. The closure consists of a lid, several wings and a front panel which are hinged together along score lines and perforated lines and which, because of the angles at which they are folded, tend to distort certain panels of the closure apparatus during the closing process which thereby holds the lid in place when the lid is in the completely closed position.

3,581,978
CROSSED-BOTTOM SACK
Hermann Kappelhoff, Hamburg; Max Gennerich; Walter Paul; Walter Steinbeck, Lengerich, and Willy Niemeyer, Natrup-Hagen, all of, Germany, assignors to Windmoller & Holscher, Lengerich, Germany
Division of Ser. No. 604,495, Oct. 10, 1966, Pat. No. 3,448,666, which is a division of application Ser. No. 356,882, Apr. 2, 1964, now Patent No. 3,313,217
Filed Mar. 19, 1969, Ser. No. 842,415
Int. Cl. B65d *31/14, 33/02*
U.S. Cl. 229—62.5 **4 Claims**



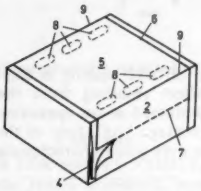
A sack of thermoplastic material having a bottom comprising, in its opened, partially formed condition, a pair of oppos-

ing corner flaps coated with adhesive on the upper sides thereof and a pair of opposing side flaps coated with adhesive on the under sides thereof, said side flaps having been folded toward each other and laid flat with their adhesive coatings exposed upwardly, and a bottom covering sheet coated with adhesive on one side thereof attached to said side flaps with their respective adhesive coatings in contact.

3,581,979
PARALLELEPIPED PACKAGE

Louis Fuchs, Neuhausen am Rheinfall, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Nov. 26, 1969, Ser. No. 880,052
Claims priority, application Switzerland, Dec. 3, 1968, 18003/68
Int. Cl. B65d *65/28, 75/08, 75/62*
U.S. Cl. 229—87R **3 Claims**

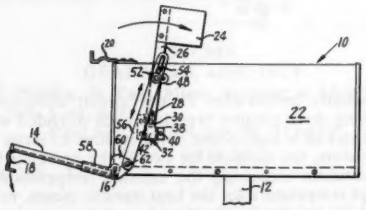


A parallelepiped package for wafer-shaped articles comprising a blank of wrapping material wrapped hoselike around the content of the package and having its ends folded against opposite end walls of the content. A tape is wrapped around the package and provided at least at one portion covering the folded flaps of the wrapping with a perforated tear line. The tape is adhesively secured near its tearable portion to the wrapping material, so that the package may be opened at one end only without unwrapping the entire content of the same.

3,581,980
RURAL MAIL BOX

Emil F. Kreycik, G-6071 Beecher Road R.D., Flint, Mich.

Filed June 19, 1969, Ser. No. 834,648
Int. Cl. A47g *29/12*
U.S. Cl. 232—35 **1 Claim**



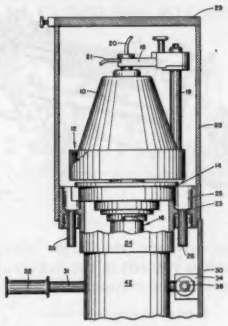
A mail box is provided with a flag adapted to be raised when a resident places mail in a box to be picked up by the carrier, and when the carrier opens the door of the box to withdraw the mail and shuts the door, the flag will automatically move to a downward inoperative position, without the necessity for the carrier having to manually reach out and push the flag to its down position.

3,581,981
CENTRIFUGE CHUCK

Allen Latham, Jr., Jamaica Plain, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.

Filed Sept. 23, 1968, Ser. No. 761,558
Int. Cl. B04b *9/00*
U.S. Cl. 233—21 **9 Claims**

An easily operated chuck for holding a plastic, or metal, centrifuge rotor. Gripping is achieved through the use of a positively actuated, inwardly distended elastomeric ring. Mechanical or motorized means are provided for braking, disengaging the gripping ring and ejecting the rotor for easy

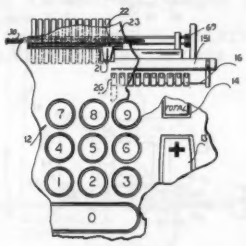


removal. The chuck is incorporated in a centrifuge assembly which provides fluid communication with the interior of the rotor to permit continuous introduction into and withdrawal of fluid from the rotor while it rotates.

3,581,982
PIN CARRIAGE RETURN MECHANISM

John G. Clary, Pasadena, and Milton V. Scozzafava, San Gabriel, Calif., assignors to Addmaster Corporation, San Gabriel, Calif.

Filed Jan. 8, 1970, Ser. No. 1,516
Int. Cl. G06c *23/04*
U.S. Cl. 235—60TK **10 Claims**



A pin carriage return mechanism is disclosed in which the pin carriage is returned from an advanced position to its initial home position by a flexible cord. The latter is attached at one end of the pin carriage and is anchored at its opposite end. An intermediate part of the cord is looped over a roller, which is orbited about a fixed center during each cycle of the machine to return the cord and pin carriage.

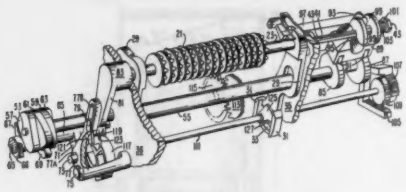
3,581,983
ACCUMULATOR WITH TENS TRANSFER MEANS DISPOSED INTERNALLY OF ITS PINION-BEARING SHAFT

Bernard Deleuze; Pierre Leonard Dugeny, both of Paris; Jean Rene Gerain, Pantin, and Jacques Michel Queffeleant, Fraconville, all of, France, assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 16, 1968, Ser. No. 762,165
Int. Cl. G06c *7/10*
U.S. Cl. 235—142 **31 Claims**

An accumulator comprising a plurality of ordinal pinions rotatably supported on a hollow shaft is provided with tens transfer means disposed within the shaft. Carry pawls protruding through apertures in the shaft are depressibly indexed by their associated pinions as the latter are rotated past their full capacity positions. Means are provided for rotating the shaft a predetermined distance in a counteraccumulating direction, and then in an accumulating direction, relative to the pinions. Means within the shaft are activated

subsequent to such counteraccumulating rotation to rockably incline the indexed pawls into coupled relationship with their adjoining higher order pinions, such coupled relationship



being effective to advance the latter pinions a one-unit distance as the shaft is rotated in the accumulating direction following its predetermined counteraccumulating rotation.

3,581,984

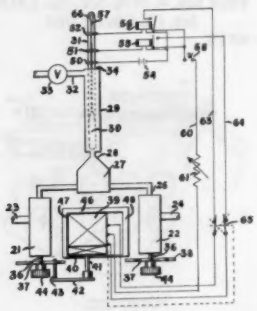
TEMPERATURE CONTROL DEVICE

Werner W. Buechner, 4407 Gladding Court, Midland, Mich.

Continuation-in-part of application Ser. No. 707,757, Feb. 23, 1968, Continuation-in-part of application Ser. No. 632,842, Jan. 23, 1967, now Patent No. 3,470,810, Continuation-in-part of application Ser. No. 677,241, Oct. 23, 1967, now abandoned , Continuation-in-part of application Ser. No. 678,987, Oct. 30, 1967. This application Feb. 28, 1969, Ser. No. 803,389

Int. Cl. G05d *23/13*

U.S. Cl. 236—12 **15 Claims**



A low-capacity water-mixing valve unit for mixing two streams of water of different temperature, using rotationally adjustable metering valves and mechanical, thermostatically controlled actuation of the metering valves, in which the water is mixed in a mixing chamber having at least 20 times the cross-sectional area of the largest orifice of the metering valves, for stabilization of the output temperature.

3,581,985

METHOD AND APPARATUS FOR MINIMUM DROOP OR RISE AND DIFFERENTIAL THERMOSTATIC TEMPERATURE CONTROL OF HEATING EQUIPMENT

John Bjarni Thorsteinsson; Herbert Torrence Hazleton, and James Welland Dalzell, all of Brandon, Manitoba, Canada, assignors to Pioneer Electric (Brandon) Limited, Brandon, Manitoba, Canada

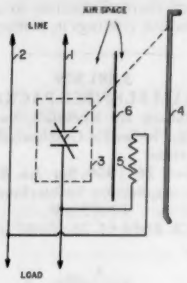
Filed Feb. 28, 1966, Ser. No. 530,485

Claims priority, application Canada, Mar. 8, 1965, 925,035

Int. Cl. G05d *23/30*

U.S. Cl. 236—68 **9 Claims**

Thermostats are provided which are useful both for heating and for cooling equipment having a minimum droop characteristic. The described thermostat includes a snap switch in series with the heating or cooling equipment and the load current flowing through the switch to the equipment develops heat in the switch. Droop is minimized by introducing a shield between the switch and the temperature-sensing bimetal, there being an air space both in front of the shield and behind the shield, and the shield having a bright reflecting surface directed toward the switch. Additionally, a heater is provided that is energized during the time intervals when



the load is turned off and heating in the switch stops. The overall heating effect resulting from the switch and the heater can be maintained at an approximate norm without regard to the percentage "on" time of the switch so that a minimum droop or even a rise characteristic can be realized.

3,581,986

CIRCUIT FOR AUTOMATICALLY CONTROLLING THE TEMPERATURE IN HEATING OR CONDITIONING SYSTEMS

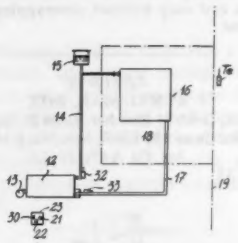
Antonio Magri, Milan, Italy, assignor to Coster Tecnologic Elettroniche S.p.A., Milan, Italy

Filed May 5, 1969, Ser. No. 821,915

Claims priority, application Italy, May 11, 1968, 16356 A/68

Int. Cl. G05b *11/32;* **G05d** *23/24*

U.S. Cl. 236—91 **4 Claims**



An automatic temperature control circuit comprising a bridge having three parallel branches, each provided with a supply resistor of a high ohmic value relative to series connected resistors, the resistors for two of the branches being thermoresistances measuring the external temperature and the average temperature for the heat transfer means, respectively, and the resistor for the third branch being series connected to a settable impedance means for setting the desired room temperature.

3,581,987

TOY STRUCTURAL SUPPORT SYSTEM AND BUILDING ELEMENTS THEREFORE

Patrick M. Tomaro, Maplewood, N.J., assignor to Remco Industries, Inc., Harrison, N.J.

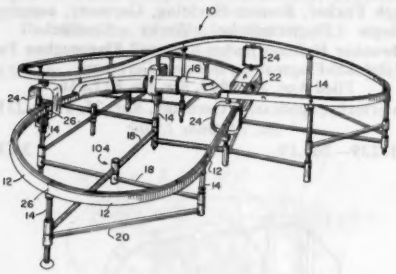
Filed June 24, 1970, Ser. No. 49,420

Int. Cl. A63h *19/00, 19/36, 21/04*

U.S. Cl. 238—10E **17 Claims**

A toy structural support system is described with beams and stanchions to support the beams and other accessory elements to form a stable three-dimensional toy building structure. The beams are retained in precision alignment and vertically supported by stanchions which are horizontally stabilized by crossmembers. The crossmembers engage the

stanchions with complementary fitting grooves and ribs. In a described embodiment the beams are shaped to form a toy



three dimensionally arrangeable track for high-speed vehicles.

3,581,988

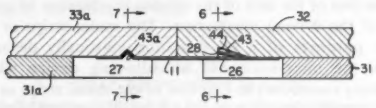
CONNECTOR FOR MODEL VEHICLE TRACKS

Chan Kin, and Colin James Woodcock, both of Hong Kong, British Crown Colony, assignors to Tyco Industries, Inc., Woodbury Heights, N.J.

Filed Mar. 26, 1969, Ser. No. 810,694

Int. Cl. A63h *19/30*

U.S. Cl. 238—10 **2 Claims**



A base for engagement beneath the flanges of adjacent rails, a pair of resilient clips on opposite sides of the base each frictionally engaging respective sides of the rail flanges, and detent means on the base for interfitting engagement with the undersides of the rail flanges.

3,581,989

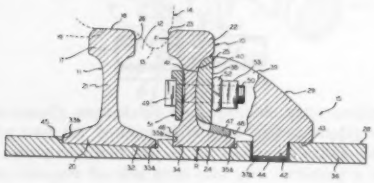
GUARD RAIL ASSEMBLY

Emrick Pohling, St. Paul, Minn., assignor to Abex Corporation, New York, N.Y.

Filed Nov. 5, 1968, Ser. No. 773,519

Int. Cl. E01b *5/18*

U.S. Cl. 238—21 **11 Claims**



Guard rail assembly for supporting a guard rail relative to a traffic rail, including a tie plate having an extension with a brace secured thereto and engaging the guard rail in place.

3,581,990

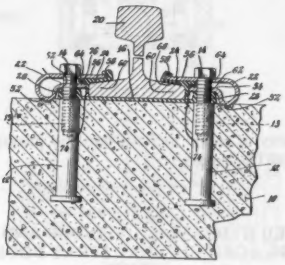
RAIL MOUNTING ASSEMBLY

Edward F. Kirik, Fairfield, Conn., assignor to Syntex Rubber Corporation, Bridgeport, Conn.

Filed Oct. 23, 1968, Ser. No. 769,967

Int. Cl. E01b *9/40, 9/14, 9/68*

U.S. Cl. 238—283 **11 Claims**



This disclosure relates to a rail mounting assembly for use on concrete ties including an electrical insulating, sound deadening, vibration damping, rubber tie pad having positioning openings therein to positively locate the pad on a concrete tie and beads formed thereon to prevent slippage of the tie pad on the tie. The assembly also includes rubber rail fastener pads to electrically isolate the metal rail fastener from the rail and to prevent slippage of the rail.

3,581,991

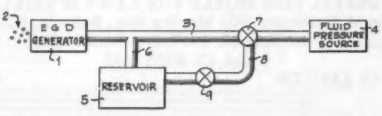
ASPIRATOR SYSTEM

Donald H. Porter, Carlstadt, N.J., assignor to Gourdine Systems, Inc., Essex, N.J.

Filed Mar. 3, 1969, Ser. No. 803,927

Int. Cl. B05b *5/00;* **F23d** *11/28*

U.S. Cl. 239—15 **4 Claims**



An aspirator system particularly for use with an electrogasdynamic generator wherein a fine aerosol is regulatably produced using a dual atomizing of the seeding medium. The seeding medium, which is contained in a suitable reservoir, is passed through a chamber prior to introduction into the main aerating fluid stream, and is preatomized in the chamber by a secondary fluid flow which may be tapped from the main aerating fluid stream. The secondary fluid enters the seeding medium reservoir to contribute to the pressure head causing medium flow and is introduced in the chamber in the form of a series of jets through holes in the chamber wall to preatomize the seeding medium therein. Control of the pressure and rate of secondary fluid flow permits fine control of the amount of seeding medium introduced into the main aerating flow and the degree of atomization achieved by the entire system.

3,581,992

STREAMING

Nathaniel Huges, Beverly Hills, Calif., assignor to Energy Sciences, Inc., El Segundo, Calif.

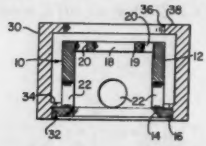
Filed Apr. 23, 1969, Ser. No. 818,750

Int. Cl. B05b *3/14*

U.S. Cl. 239—102 **11 Claims**

Fluid nozzle with an axial flow passage, an inlet of area less

than that of the passage directly downstream thereof, and an



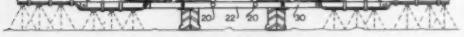
even plurality of radial orifices into the passage arranged in coaxial pairs 180° apart.

3,581,993

COMBINED HYDRAULIC CYLINDER AND VALVE FOR FOLDING AGRICULTURAL SPRAY BOOM AND THE LIKE

Robert M. Reams, Route 2, Apex, N.C.

Filed Mar. 10, 1969, Ser. No. 805,600
Int. Cl. B05b *1/20;* **B67d** *5/08;* **B05b** *9/06*
U.S. Cl. 239—167 **4 Claims**



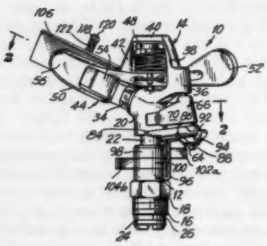
A foldable agricultural spray boom incorporates a hydraulic cylinder which causes the boom to unfold when actuated by the pressurized spray liquid and in the unfolded position the cylinder acts as a valve by establishing a fluid path through the cylinder to the boom spray nozzles.

3,581,994

DEFLECTION SHIELD FOR LAWN SPRINKLER

Edwin M. Heiberger, 806 Marilyn Ave., Baldwin, N.Y.

Filed Feb. 20, 1969, Ser. No. 800,925
Int. Cl. B05b *3/02*
U.S. Cl. 239—230 **6 Claims**



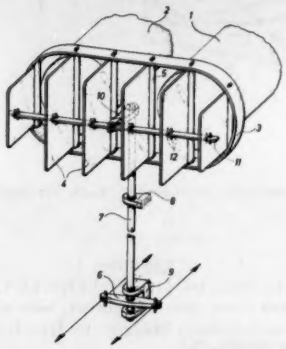
A water sprinkler deflection shield fabricated from sheet metal has an integral appendage formed from the same metal sheet, which extends into contact with the body of the sprinkler and is secured thereto for mounting the deflection shield in place. The shield serves to intercept jets of water which would otherwise be deflected by the impulse arm of the sprinkler toward an area outside the arc of sprinkler rotation. An adjustable, spring-held diffusion screw is threaded through the shield, and serves to fragment the errant jets of water.

3,581,995

DEVIATING DEVICE FOR PARTICULARLY HOT EXHAUST GAS JETS OF AIR VEHICLE DRIVING MECHANISMS

Christoph Fischer, Bremen-Huchting, Germany, assignor to Vereingte Flugtechnische Werke Gesellschaft mit beschranker Haftung fruher "Weser" Flugzeugbau Focke-wulf Heinkel-Flugzeubau, Bremen, Germany

Filed Apr. 21, 1969, Ser. No. 817,816
Claims priority, application Germany, Apr. 25, 1968, J21666
Int. Cl. B64c *15/00*
U.S. Cl. 239—265.19 **3 Claims**



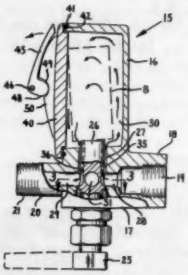
A deviating device, especially for particularly hot exhaust gas jets of air vehicle driving mechanisms, which comprises a plurality of metal strips or plates which are fixedly arranged on the outlet of the driving mechanism and which extend in the direction of the axis of the driving mechanism beyond the outlet of the driving mechanism. The metal strips or plates are for purposes of a jet deviation elastically deformable through the intervention of an adjusting device which is operatively connected to that end of the metal strips or plates which is remote from the outlet of the driving mechanism.

3,581,996

SOAP ATTACHMENT FOR SHOWER BATH

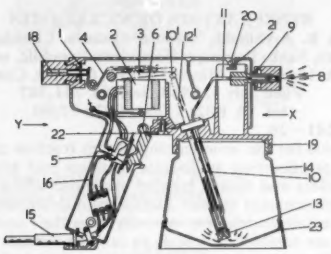
Oscar E. Boyer, 4630 N.E. Wygant Street, Portland, Oreg.

Filed Mar. 3, 1969, Ser. No. 803,601
Int. Cl. B05b *7/26*
U.S. Cl. 239—317 **7 Claims**



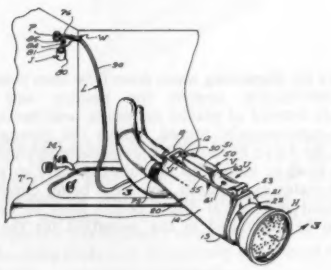
A soap container is mounted on the pipe to the shower spray head. A two-way valve in the device directs the flow of water either through the soap chamber or bypassing the soap chamber so that soapy or clear water may be caused to issue from the spray head.

3,581,997
SPRAY GUN MEANS
Norman W. Stevenson, Macclesfield, England, assignor to Burgess Products Company Ltd., Hickley, Leicestershire, England
Filed Jan. 6, 1969, Ser. No. 789,122
Int. Cl. B05b *9/04*
U.S. Cl. 239—332 10 Claims



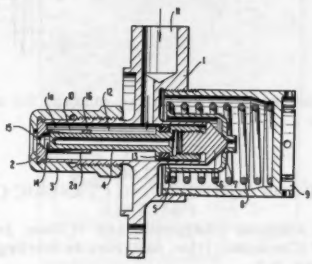
A spray gun and container means threadably and sealably cooperating therewith for holding a supply of liquid therein and a reciprocable pump operably extending into the container selectively operated by a vibrator motor means and lever means controlled by a handle trigger switch means in the gun to pump the liquid in the container through a spray nozzle of the gun for dispensing the liquid from the container. The base portion of the handle of the gun extending in a slanting manner and adapted to suitably rest on a base common to the container base.

3,581,998
SOAP DISPENSING MEANS
Maurice F. Roche, 220 Park Ave., Apt. 5, Long Beach, Calif.
Filed July 29, 1970, Ser. No. 59,256
Int. Cl. F23d *13/38*
U.S. Cl. 239—415 10 Claims



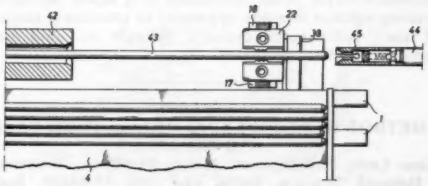
A manually engageable and operable valve-controlled irrigating unit for bathers connected with a supply of water and a supply of liquid soap by an elongate flexible water hose and an elongate flexible soap tube and including a jet pump means and manually operable air and soap control valving means operable to effect the constant discharge of water, the constant discharge of aerated water, the thumb-controlled selective discharge of water or aerated water, the constant discharge of air, soap and water, the thumb-controlled selective discharge of air, soap and water or soap and water and the constant discharge of soap and water.

3,581,999
FUEL CONTROL NOZZLE, PARTICULARLY FOR GAS TURBINE COMBUSTION CHAMBERS
Adolf Fehler, Puchheim, Germany, assignor to M.A.N. Turbo G.m.b.H., Munich, Allach, Germany
Filed Mar. 19, 1969, Ser. No. 808,405
Claims priority, application Austria, Mar. 29, 1968, A3101/68
Int. Cl. B05b *1/34*
U.S. Cl. 239—483 5 Claims



A fuel control nozzle, particularly for gas turbine combustion chambers in which the control piston is provided with fuel-metering slots of closed profile and the atomizer head has a closed circumference at its rear end.

3,582,000
WORKPIECE FEEDING DEVICE
Johannes Werkmeister, Reichenbach Fils, and Holger Scheler, Faurndau, Germany, assignors to Firma Hermann Traub, Reichenbach (Fils), Germany
Filed Apr. 30, 1969, Ser. No. 820,354
Claims priority, application Germany, Feb. 8, 1969, P 19 06 423.4
Int. Cl. B23q *5/22*
U.S. Cl. 214—1.1 10 Claims

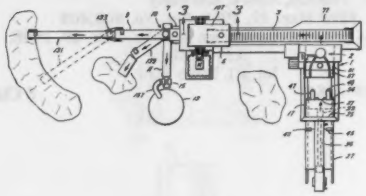


A device for feeding workpieces for machine tools including a feed member and clamp for holding the workpiece and feeding it to the machine tool by displacement of the feed member and also including a movable carrier having two jaws for gripping the workpiece. A first driving means is provided for moving the carrier such that the jaws may be placed in, or out of, the path of displacement of the feed member and a second driving means is provided for opening and closing the jaws.

3,582,001
SYSTEM AND METHOD FOR REFINING FERROUS-BEARING SCRAP MATERIAL
Irving B. Rose, 4135 Mischire St., Houston, Tex.
Filed Aug. 13, 1968, Ser. No. 752,374
Int. Cl. B02c *19/12*
U.S. Cl. 241—3 7 Claims

A mechanized system and processing method for refining gross raw scrap material, such as automobile bodies and frames, other larger objects such as refrigerators, and smaller pieces of scrap material of various shapes and sizes, to produce therefrom a fluent mass of particulate metal rela-

tively free of nonmetallic refuse, and separated into ferrous and nonferrous portions, the ferrous portion so formed being



in condition for direct use as raw material for steel-making operations.

3,582,002
METHOD FOR COMMINUTING CYANURIC CHLORIDE CRYSTALS

Theodore Ashmead Langstroth, and William Joseph Miles, both of Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 5, 1968, Ser. No. 710,653
Int. Cl. B02c *19/06*
U.S. Cl. 241—5 **1 Claim**

Finely divided solid cyanuric chloride having high chemical reactivity is prepared by reducing the size of relatively large cyanuric chloride particles to an average particle size of 2 to 8 microns in fluid energy attrition apparatus.

3,582,003
PROCESS FOR COMMINUTING CYANIME CHLORIDE CRYSTALS

Theodore A. Langstroth, 5959 Rhode Island Ave., Cincinnati, Ohio

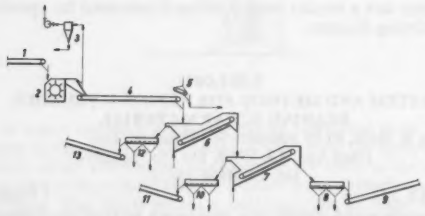
Continuation-in-part of application Ser. No. 615,881, Feb. 14, 1967, now abandoned. This application July 11, 1969, Ser. No. 841,116
Int. Cl. B02c *1/00;* **B04b** *15/04*
U.S. Cl. 241—16 **3 Claims**

Cyanuric chloride crystals are ground by attritive action of zirconium oxide beads suspended in a liquid medium in a rotating-agitator attrition apparatus to produce a suspension of finely comminuted cyanuric chloride in liquid medium useful in chemical syntheses.

3,582,004
METHOD OF RECOVERING METALS FROM CABLES AND THE LIKE

Hans Lenz, Heiligenhaus; Jochen Mehlbeer, Wattenscheid; Heinrich Macura, Essen, and Otto Weidner, Bochum-Stiepel, all of, Germany, assignors to Eisen und Metall A.G., Gelsenkirchsen, Ahlmannstof, Germany

Filed June 11, 1968, Ser. No. 736,071
Claims priority, application Germany, June 12, 1967, June 13, 1967, May 3, 1968, E34,165; P 15 58 407.3; P 17 58 265.9
Int. Cl. B02c *21/00*
U.S. Cl. 241—19 **6 Claims**



A method for recovering metals from discarded cables and the like wherein the discarded cables are comminuted in a hammer mill and, after removing light components by suction and of iron components by magnetic action, may be additionally comminuted by a cutting action. The comminuted material is successively treated in belt sink separators individually associated with draining screens and conveyors operatively connected therewith for removing floats from the first separator or separators and sinks from the last separator. The several sink separators are operated at different turbidities.

3,582,005
BENEFICIATION OF NICKEL ORES

Frederick R. Archibald, Toronto, Ontario, Canada, and Ian H. Keith, Santo Domingo, Dominican Republic, assignors to Falconbridge Nickel Mines, Limited, Ontario, Canada

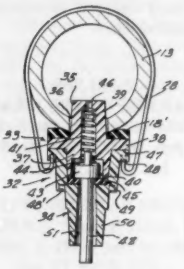
Filed July 1, 1968, Ser. No. 741,747
Int. Cl. B02c *17/04;* **C22b** *23/00*
U.S. Cl. 241—26 **4 Claims**

A process for the beneficiating of that fraction of oxidized nickel ores occurring as discrete boulders and joint blocks. The boulders and blocks treated are those which have undergone enrichment at their surfaces and decreasing degrees of intermediate enrichment inwardly from their surfaces. The boulders are tumbled in a body in rubbing contact with each other to form comminuted high-grade product and low-grade reject cores.

3,582,006
DRINKING VALVE FOR POULTRY AND LIVESTOCK

Earl Clayton Thompson, Rt. 2, Box 453, Waco, Tex.

Filed Apr. 29, 1969, Ser. No. 820,237
Int. Cl. A01k *7/00*
U.S. Cl. 251—146 **10 Claims**



A valve for dispensing water from flow lines connected in a water distribution system for poultry and livestock, preferably formed of plastic materials, and having a spring-biased stem normally seated against the passage of water through the valve but having means thereon enabling an individual fowl or animal to actuate the stem to unseat it to dispense water as required, the stem being capable of both longitudinal and lateral displacement from its seat. A bowl may also be embodied in the invention for the service of animals.

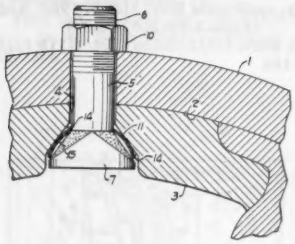
3,582,007
T-BOLT AND PAD FOR LINER MOUNTING

Robert N. Heighberger, Moreland Hills, Ohio, assignor to Joseph Dyson & Sons, Inc., Eastlake, Ohio

Filed July 22, 1968, Ser. No. 746,647
Int. Cl. B02c *17/22*
U.S. Cl. 241—183 **3 Claims**

A cylindrical grinding mill shell with liner segments maintained in operable position by bolts extending through slots in the segments and openings in the shell with nuts threadable engaging the bolts at the outer ends thereof abutting the outer wall of the shell. Pad members of polytetrafluorethylene are positioned between each bolthead and corresponding mating surface of each segment. The pad

members have a very desirable plastic memory, good absorption for vibration effects, a high resistance to temperature



distortion and destruction and provide a certain lubricity which facilitates subsequent disassembly.

3,582,008

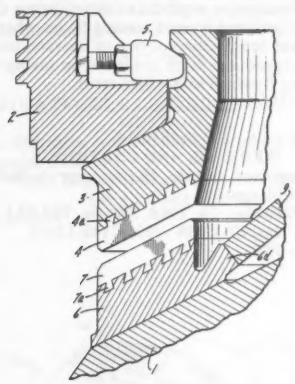
BIMETAL CRUSHER LINER

Jerome C. Motz, Milwaukee, and Francis Scaffidi, West Allis, both of, Wis., assignors to Nordberg Manufacturing Company, Milwaukee, Wis.

Continuation of application Ser. No. 617,284, Feb. 20, 1967, now abandoned. This application July 8, 1969, Ser. No. 842,818

Int. Cl. B02c *2/04*

U.S. Cl. 241—294 **6 Claims**



A wearing part for use in gyrated crushers. Either the mantle or bowl liner of a crusher are made of a composite in which a backing member with a high tensile strength supports a crushing or working surface having high wear resistance. The working surface is in the form of discontinuous surface members permanently mounted on or cast integrally with the backing body and structurally connected only by the backing body.

3,582,009

TAPE CARTRIDGE WINDING MACHINE

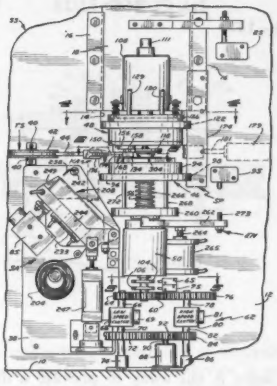
Gerald E. Ceroll, Minneapolis, Minn., assignor to General Mills, Inc.

Filed Aug. 1, 1969, Ser. No. 846,844

Int. Cl. B65h *19/20, 19/18*

U.S. Cl. 242—56 **31 Claims**

The machine winds magnetic recording tape supplied from a spool onto the reel of a tape cartridge. The loose or leading tape end is held in a displaced relation with the reel during most of winding, and after the winding has been completed, the wound tape is automatically severed from the remaining supply of tape. The resulting trailing end and the original leading end, which then abut each other, are spliced together



to produce an endless tape array. The machine thereafter ejects the cartridge casing and reel.

3,582,010

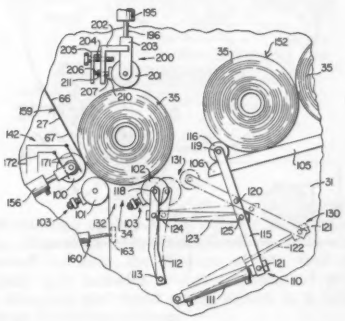
APPARATUS FOR AND METHOD OF MAKING A COIL CONSTRUCTION

Benton A. Whiteman, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sept. 18, 1968, Ser. No. 760,633

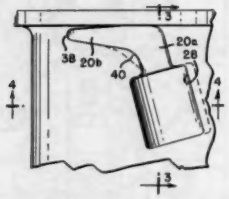
Int. Cl. B65h *19/20*

U.S. Cl. 242—58 **8 Claims**



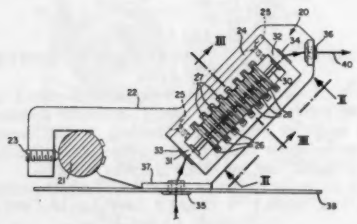
Apparatus for and method of controlling the unwinding of an elongated strip material from a supply roll thereof during the coiling of such strip material to define a coil construction wherein a substantially planar support inclined at an acute angle relative to a vertical plane is utilized together with a plurality of supporting rollers which engage the lower outer periphery of such supply roll to define an unwinding station. Means is also provided for serially feeding supply rolls to the unwinding station and automatically splicing the leading end portion of each new supply roll to the trailing end portion of an unwound roll without stopping the coiling operation.

3,582,011
QUICK RELEASE DRUM CABLE ANCHOR
John B. W. Murray, White Rock, British Columbia, Canada, assignor to Gearmatic Co. Ltd., North Surrey, British Columbia, Canada
Filed Apr. 16, 1969, Ser. No. 816,651
Int. Cl. B65h 75/28
U.S. Cl. 242—117 10 Claims



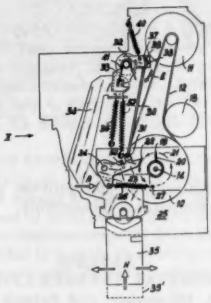
A cable drum is cut away to provide a drum pocket to receive enlargement such as a ferrule on the end of a cable. The drum pocket is set at an angle with respect to the departure line of the cable from the drum so that the spring tension of the bent cable maintains the ferrule in the drum pocket. Opposed shoulders on the drum pocket and a cable departure slot leading therefrom maintain the ferrule in the drum pocket until the cable is completely unwound from the drum and quick release is required.

3,582,012
RING TENSIONER
John Cocker, III, Box 235, Clover, S.C.
Continuation-in-part of application Ser. No. 751,605, Aug. 6, 1968, now abandoned , and a continuation-in-part of 798,059, Feb. 10, 1969, now abandoned. This application July 8, 1969, Ser. No. 839,833
Int. Cl. B65h 59/26
U.S. Cl. 242—153 15 Claims



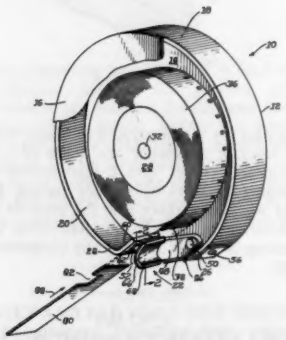
A device for imparting tension to a moving line of textile material consists of a rectangular body having a guide eye at either end to guide the textile material longitudinally through the body. A plurality of rings are disposed in spaced relation longitudinally within the body. The rings are designed to hang on the textile material passing through the body and thereby impart tension to it. Means are provided for adjusting the position of the body in several planes. The construction of the body is likewise changed in alternate embodiments to provide a means for varying the tension on the textile material by controlling the position of the rings and their coaction with the body. In still further embodiments, elements are added to the body to engage and coact with the rings to dampen their movement.

3,582,013
TAPE RECORDER/REPRODUCER DEACTIVATING DEVICE
Alessandro Beretta, 16, Piazza Insubria, Milan, Italy
Filed May 7, 1969, Ser. No. 822,374
Claims priority, application Italy, May 9, 1968, Aug. 9, 1968, 16304-A/68;20024-A/68
Int. Cl. B65h 59/38; G03b 1/04; G11b 15/32
U.S. Cl. 242—186 3 Claims



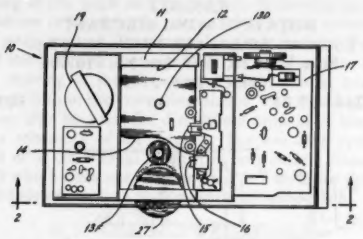
A device for automatically deactivating a magnetic tape recorder/reproducer in which the tape is wholly contained in a magazine or cassette, together with a supply and a takeup reel therefor, the ends of the tape being secured to the cores of said reels, and in which the tape is subject to an overpull when completely wound about one reel. The device comprises a tape pull sensing finger subject to displacement when said overpull occurs, a reproducer deactivating device, and trigger means actuated by said sensing finger when displaced for causing said deactivating device to operate, preferably by unlocking a reproducer latch means upon taking-off a force from a rotating flywheel in the apparatus.

3,582,014
WEB CASE AND CARTRIDGE
Lester V. Jorgensen, Skokie, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Nov. 29, 1968, Ser. No. 780,063
Int. Cl. G03b 1/02; G11b 15/22
U.S. Cl. 242—188 8 Claims



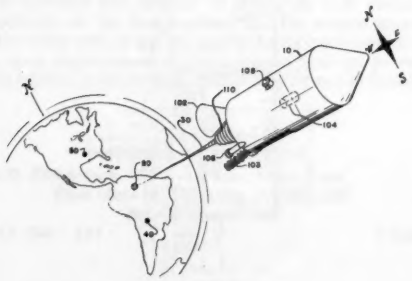
A brake mounted in the dispensing orifice of the case is cammed by the web into nongripping association with the web to enable web rewinding into the case. Wen the camming support for the brake is broken by an opening in the leader of the web, the brake becomes biased into gripping association with the web to prevent further web rewinding.

3,582,015
CONTROL MECHANISM FOR TAPE PLAYERS AND THE LIKE
Joseph E. Laschenski, Philadelphia, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.
Filed Oct. 29, 1969, Ser. No. 872,435
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—206 6 Claims



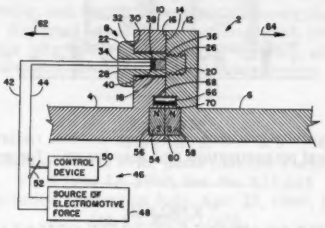
Pause and rewind controls for tape apparatus such as tape recorders and reproducers. In the housing of the illustrated player a gear member is journaled at one end of a movable link, with part of the gear projecting from a sidewall of the housing to provide a thumb wheel. Manual pressure on this thumb wheel pivots the link, against a spring force, and engages the wheel or gear with a pinion, and thereby with a tape reel in the housing. The arrangement is such that by such engagement, the reel and tape are caused to stop. In addition, the thumb wheel can be rotated manually in one direction, so that said pinion causes rewinding of the tape.

3,582,016
SATELLITE ATTITUDE CONTROL MECHANISM AND METHOD
Bernard C. Sherman, Apt. 502, 34 Carscadden Drive, Willowdale, Ontario, Canada
Filed Oct. 3, 1967, Ser. No. 672,502
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 38 Claims



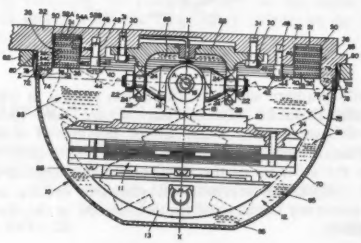
Satellites elongated by the extension of booms are stabilized in a vertical orientation by gravity-gradient. Improvement of precision by further extension of rigid booms is impractical. Gravity-gradient stabilization by a short boom and a long tether to an auxiliary body taken in combination with reaction jet control of long-period dumbbell oscillations is disclosed. In further combination with a rotor for yaw stabilization, precision three-axis gravity-gradient stabilization is achieved. The new system contemplates a tether an order of magnitude greater in length than tethers contemplated in previously disclosed arrangements.

3,582,017
MAGNETIC SEPARATION DEVICE
Alphonse M. Zecca, Dallas, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.
Filed Sept. 13, 1968, Ser. No. 759,580
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 8 Claims



An assembly comprising a plurality of separable sections releasably interconnected. A control device is provided for releasing the separable sections in response to a predetermined signal, and a magnetic separation means is operatively associated with the separable sections for exerting a separation force therebetween upon release of the sections.

3,582,018
AN AIRCRAFT INSTRUMENT INCLUDING PENDULOUS MEMBER LIMITED IN MOVEMENT BY A SELF-RESTORING ENERGY ABSORBING STOP
Benjamin John Tirabassi, Westwood, N.J., assignor to The Bendix Corporation
Filed Jan. 21, 1969, Ser. No. 792,675
Int. Cl. B64d *43/00*
U.S. Cl. 244—1 10 Claims

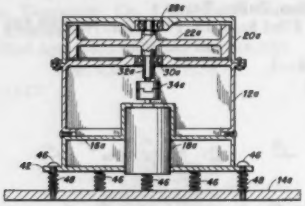


A self-restoring energy absorbing stop in a free pendulous magnetic azimuth detector mechanism in which the resilient stop serves to limit the motion of the free pendulous mechanism and includes a novel means of providing a viscous damping and rapid spring return in a low volume, high energy absorbing package.

3,582,019
ROTOR FOR SATELLITE STABILIZATION
Vincent L. Pisacane, Laurel, Md.
Filed Mar. 24, 1969, Ser. No. 809,561
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 4 Claims

The subject invention relates to a rotor for three-axis stabilization of a passively damped gravity-gradient spacecraft, and more particularly to a rotor for yaw stabilization, yaw-roll decoupling, and libration damping, when used in combination with an energy dissipator, for example, a ball-in-ball damper. The angular momentum vector of the rotor is oriented along the preferred pitch axis of the spacecraft. The motor is utilized to spin the rotor and produce a yaw-con-

trolling reaction torque of the spacecraft and, thereby, to overcome disturbing torques occasioned by thermal bending



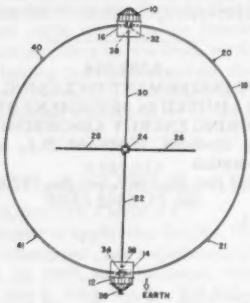
forces in gravity-gradient stabilizing booms, radiation pressure, residual magnetization and aerodynamic forces.

3,582,020

GRAVITY GRADIENT SATELLITE ORIENTATION SYSTEM FOR HIGH POINTING ACCURACY

Edwin H. Wrench, La Jolla, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Dec. 1, 1969, Ser. No. 881,178
Int. Cl. B64g *1/10*
U.S. Cl. 244—1SA **15 Claims**



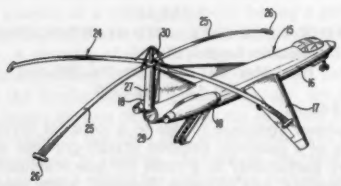
A gravity gradient satellite orientation system in which tip weights that may be satellite halves, are held in spaced separation by a flexible cable under tension of a resilient means that biases the tip weights apart, which system preserves the stiffness of the dumbbell configuration against magnetic torque and thermal distortions to reduce error in pointing accuracy because of tip deflections in the dumbbell configuration.

3,582,021

VERTICAL TAKEOFF AND LANDING AIRCRAFT AND METHOD OF OPERATION

David R. Pender, 1018 Marion St., Columbia, S.C.

Filed Aug. 13, 1969, Ser. No. 849,679
Int. Cl. B64c *27/22, 37/00*
U.S. Cl. 244—7 **11 Claims**



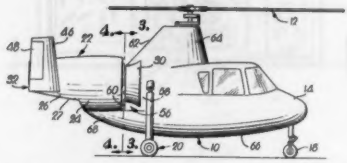
A generally conventional fixed wing aircraft has a lifting rotor pivoted thereto near the aircraft tail on a transverse or pitch axis. During takeoff, power is shunted to the lifting rotor and the aircraft is lifted substantially vertically by its tail to a practical elevation. Power is then diverted from the lifting rotor to the normal propulsion means of the aircraft and after first dropping downwardly, the aircraft levels off and flies in a conventional manner as the lifting rotor is collapsed and drawn longitudinally into a storage chamber within the fuselage through a rear opening in the longitudinal chamber.

3,582,022

ROTATING-WING AIRCRAFT

Ralph R. Robinson, P.O.Box 668, Middlesboro, Ky.

Filed Mar. 26, 1969, Ser. No. 810,601
Int. Cl. B64c *27/00*
U.S. Cl. 244—17.21 **10 Claims**



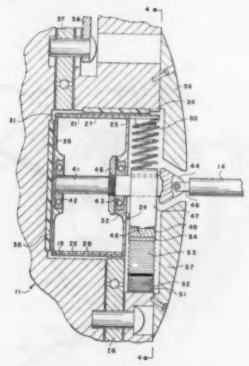
A rotating-wing aircraft is provided with a propeller assembly extending rearwardly from the rearmost end of its fuselage, such assembly being in the nature of tubular structure which receives the entire slipstream of a propeller that is rotatable therein about an axis that is aligned with the fuselage. An air scoop around the fuselage utilizes the dynamic pressure of the airstream in maintaining a flow of air to the tubular structure.

3,582,023

PITCH CONTROL FOR ROTARY WING AIRCRAFT

William N. Rosta, and Russelle L. Maxwell, both of Fort Worth, Tex., assignors to The VLM Corporation, Fort Worth, Tex.

Filed July 23, 1969, Ser. No. 844,030
Int. Cl. B64c *29/00*
U.S. Cl. 244—23 **14 Claims**



A rotary wing aircraft includes a central fuselage and a rotor consisting of an inner annular hub rotatably supported on and encircling the fuselage, radially extending radial blades and an outer supporting ring. The rotor is adapted to be driven by a turbine device associated with the rotor outer ring and an outer track nonrotatably attached to the fuselage. Each rotor blade is attached to a radially disposed, rotatable spindle in the hub structure; and pitch control arms are fixed to these spindles for controlling the rotation of the spindles and, therefore, the pitch of the attached rotor blades. An an-

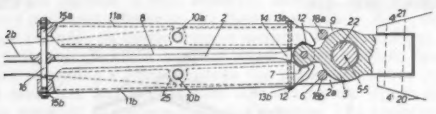
nular, pneumatically controlled bellows system, mounted on the fuselage concentric with the hub selectively controls the oscillation of the pitch control arms and thereby provides collective and cyclic pitch control for the rotor blades.

In a rotary wing aircraft, such as a helicopter, it is conventional to provide means for changing the pitch of the rotor blades for control of the aircraft. The changing of the pitch of each of the rotor blades simultaneously and uniformly is referred to as "collective pitch control," this control being used to increase or decrease the lift of the rotor. The variable changing of the pitch of a rotor blade in relation to its angular position relative to the aircraft fuselage is referred to as cyclic pitch control. This control is used, during forward motion of the aircraft, to compensate for the fact that the rotor blades moving in the direction of flight should have a different pitch than the retreating blades. This cyclic pitch control may also be used for directional control of the aircraft and for trimming of the aircraft. The use of a cyclic pitch control of a directional control is particularly important in aircraft which does not have any tail structure for directional and attitude control, as do conventional helicopters.

3,582,024
AIRCRAFT ARRESTING HOOK CENTERING MECHANISM

Arthur Neville Rhodes, Preston, and Ian C. Taig, St. Annes, both of, England, assignors to British Aircraft Corporation Limited

Filed July 23, 1969, Ser. No. 844,127
Int. Cl. B64c *25/68*
U.S. Cl. 244—110 **5 Claims**

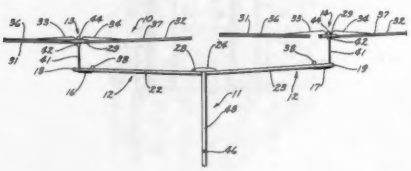


A self-centering mechanism according to this invention comprises a first member and a second member connected to one another by a main pivot and urged towards a predetermined relative angular position by two springs, and each spring has the form of a beam, the springs lying with their lengths substantially parallel to one another and being each mounted on the first member by a respective pivot at an intermediate point in the length of each spring, the three pivots being substantially parallel to one another, each spring having at one end two surfaces to cooperate with abutments respectively on the first member and the second member, and the other ends of the two springs being interconnected so that, upon displacement of the members from the predetermined relative position, both springs are stressed in bending.

3,582,025
WINGED ROTARY KITE

Lynn D. Richardson, 111 Lynn Ave., Ames, Iowa

Filed Mar. 14, 1969, Ser. No. 807,247
Int. Cl. B64c *31/06*
U.S. Cl. 244—154 **7 Claims**

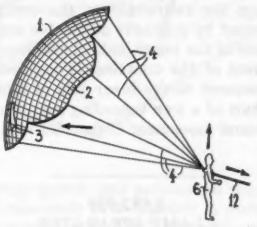


This invention relates to a winged rotary kite which has its lift power generated by wind driven rotors and is adaptable for use under normal conditions without the need for a tail, the kite comprising a finlike body to provide directional stability; a member attached to the body for connecting a flexible towline thereto; a wing mounted on and bisected by the body; a pair of axles connected to the distal ends of the wing and extending upwardly therefrom; and a rotor rotatably mounted on each axle, each rotor being spaced a distance above the wing, whereby the rotor as it passes over the wing is maintained in turbulent air rather than in direct airflow thus obtaining less drag on the rotor as it passes over the wing, as compared to the drag on the rotor when it is not over the wing, and by this arrangement causing the turbulent air to be dispersed inwardly from below each rotor toward the fuselage where it is then dumped rewardly, enabling the kite to maintain pitch and vertical stability.

3,582,026
TOY KITE

Roberto Giolitto, 19 Via Principessa Clotilde, Turin, Italy

Filed June 23, 1969, Ser. No. 835,665
Claims priority, application Italy, Apr. 23, 1969, 19365/69
Int. Cl. B64c *31/06*
U.S. Cl. 244—155 **4 Claims**

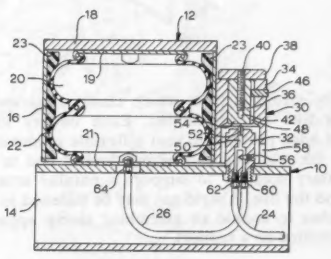


A toy kite in the form of a parachute having a suspended object, and provided with a pulling cable for holding the kite against the wind, thus lifting the toy as an ordinary kite, whilst by releasing the pulling action on the cable, the toy descends gently with the suspended object, as an ordinary parachute.

3,582,027
APPARATUS FOR ISOLATING VIBRATIONS

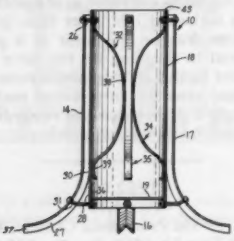
Herbert F. Hackbarth, Worthington, and Arthur E. Reams, Columbus, both of, Ohio, assignors to Consolidated Kinetics Corporation, Columbus, Ohio

Filed Mar. 10, 1969, Ser. No. 805,675
Int. Cl. F16j *15/04, 11/00*
U.S. Cl. 248—20 **10 Claims**



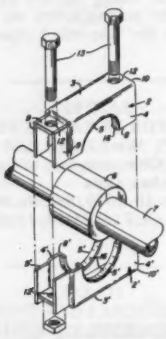
A vibration isolation mount comprising a load-supporting means mounted on an inflatable air chamber and means for controlling the pressure automatically within the chamber to maintain the load-supporting means at a constant level. Limit means is provided to prevent excessive movement of the load-supporting means and consequent damage to the assembly upon deflation of the air chamber.

3,582,028
TREE HOLDER
John G. Purdy, 708 Mary St., Dowagiac, Mich.
Filed Aug. 16, 1968, Ser. No. 753,141
Int. Cl. A47g *33/12*
U.S. Cl. 248—44 **4 Claims**



A tree holder having an upwardly opening and elongated container supported by four legs which extend downwardly along and then outwardly and downwardly from the container. The legs are connected to the container near the lower ends thereof by manually adjustable means for changing the locations of the lower ends of said legs relative to the lengthwise extent of the container. Four resiliently flexible elements are secured to the inner side of said container for engaging the butt of a tree extending into the container and for resisting lateral movement of the butt with respect to the container.

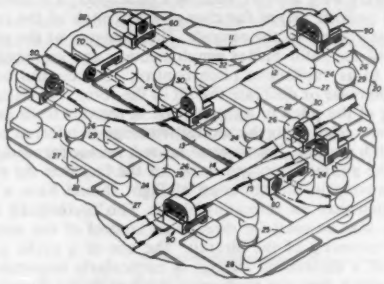
3,582,029
CLAMP APPARATUS
Henry E. Moesta, Whitehall, Pa., assignor to Ramcor, Inc., Pittsburgh, Pa.
Filed Apr. 9, 1969, Ser. No. 814,742
Int. Cl. F16l *3/22*
U.S. Cl. 248—68 **7 Claims**



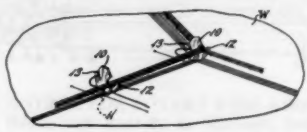
Unitary members from which clamp apparatus for tubes and the like are assemblied. Each unitary member has rounded edge portions to seat a flexible grommet or a pipe, tube or the like, and can be interlocked end to end with a like unitary member to support a parallel array of pipes, tubes and the like. A weld nut may be fastened in each unitary member to enable an assembled clamp apparatus to be flush mounted on a support.

3,582,030
PLASTIC RETAINER FOR BATTERY CABLES
James H. Barrett, Jr., 3863 Surrey Road, Toledo, Ohio
Filed July 3, 1969, Ser. No. 838,853
Int. Cl. F16l *3/00*
U.S. Cl. 248—74 **11 Claims**

A plastic battery cable support holder or retainer having flexible or resilient portions and including a base portion provided with facing L-shaped fingers extending in one direction therefrom adapted to snap over and snugly engage an intercell connector of an industrial battery. An apertured body portion, extending from the base portion in another direction, supports a battery cable in a spaced relation to the top surface of the industrial battery.

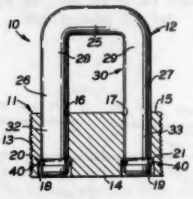


3,582,031
WIRING HARNESS BRACKET
William W. Scott, Raleigh, N.C., assignor to Aerotron, Inc., Raleigh, N.C.
Filed May 7, 1969, Ser. No. 822,567
Int. Cl. F16l *3/00*
U.S. Cl. 248—216 **4 Claims**



A bracket for a harness board has a three-part main body and a prong for driving into a board, the main body having on one side a partial enclosure for holding a wire bundle and on the other side a wedge-shaped notch for holding the ends of one or more wires, the central portion having a flattened raised area for driving the point, the body having auxiliary points of lesser length, and an engageable prying portion.

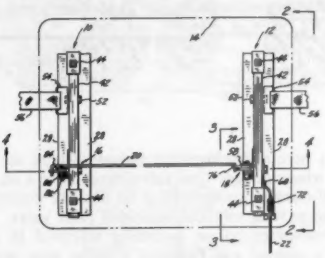
3,582,032
BREAKAWAY SUSPENSION DEVICE
Eugene W. Placek, Parma, Ohio, assignor to Allied Industries, Inc., Akron, Ohio
Filed Oct. 9, 1968, Ser. No. 766,096
Int. Cl. F16b *31/00*
U.S. Cl. 248—317 **1 Claim**



A breakaway suspension device for the joinder and controlled separation of two objects having a receiver member attached to one of the objects and provided with one or more through bores, a connector member having a bail portion adapted to engage the other of said objects and having a

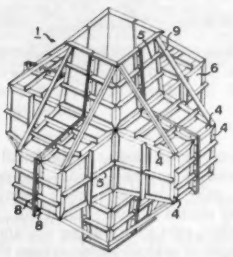
shank portion extending into the through bore in the base member, and a release member interposed between the shank portion of the connector member and the bores in the receiver member and having predetermined severability.

3,582,033
ADJUSTABLE VEHICLE SEAT MOUNTING
Oakley A. LaFleche, Eureka Springs, Ark., and Harry Wonell, Garden City, Mich., assignors to Howell Industries, Incorporated, Detroit, Mich.
Division of Ser. No. 614,863, Feb. 9, 1967, Pat. No. 3,469,812
Filed June 5, 1969, Ser. No. 830,629
Int. Cl. B60n *1/08*; **F16m** *13/00*
U.S. Cl. 248—430 **9 Claims**



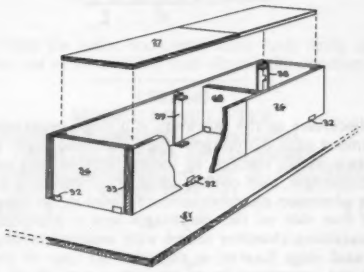
A pair of interconnected, spaced-apart slide devices arranged to support a seat assembly between longitudinally spaced positions relative to the floor of a vehicle. Each slide device includes an upper support member for attachment to the seat unit, a lower support fixed to the vehicle floor, means providing a track between the upper and lower support members and latch means for locking the upper and lower supports at a selected relative position. The upper support member also has means for anchoring the terminal ends of a safety belt assembly associated with the seat assembly. The upper support also has a pair of rigid flange sections straddling a slide unit and arranged to prevent separation of the slide unit components. The latching means includes a latch member associated with each of the slide devices and interconnected one to the other for cooperative movement between a first position wherein the latches engage a selected pair of teeth formed in the lower fixed supports to lock the two supports one to the other and a second position wherein the latches disengage the teeth to free the upper movable supports for longitudinal movement relative to their respective lower fixed supports.

3,582,034
MOLD FOR CASTING A BREAKWATER CONCRETE BLOCK
Yoshiro Tsuzuki, No. 808, Seijo-Cho Setagaya-ku, Tokyo, Japan
Filed Jan. 6, 1969, Ser. No. 794,840
Int. Cl. E02b *1/00*
U.S. Cl. 249—10 **5 Claims**



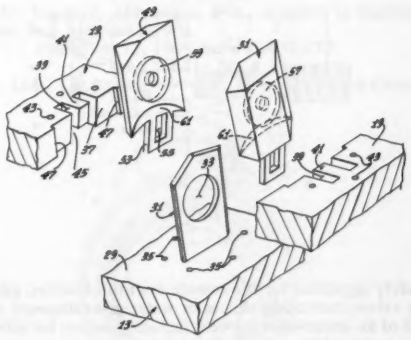
A mold for casting breakwater concrete blocks defining a block having a central hexahedron body and six symmetrically spaced legs radiating from the six surfaces of said body, each of said legs being in the form of a truncated pyramid, said mold being divided into symmetrical mold portions along two symmetrical planes, each of said planes including an axis of said mold, each of said portions being provided with flanges along its periphery adapted to permit the joining of said portions.

3,582,035
CONCRETE PAN FORMING SYSTEM
David R. Wells, Westminster, Colo., and James W. Franklin, Albuquerque, N. Mex., assignors to Structural Voids, Inc.
Filed June 8, 1967, Ser. No. 644,529
Int. Cl. E04g *11/36*
U.S. Cl. 249—18 **13 Claims**



A pan-forming system and accessories therefore utilizing loose sheet components held together in operative relationship by said accessories, in which lip members on said accessories or elements of the accessories are engaged between adjacent sheet materials as spacers holding said sheet components slightly spaced apart to facilitate stripping of said forms for early reuse. Accessories are provided for solid deck or open center support systems with the open center units being useable for various depth pans that may be stripped away from the set concrete without necessitating removal of the open center supports.

3,582,036
MOLD FOR MAKING HONEYCOMBS
Rafael M. Condis, 4321 Rosecrans, Hawthorne, Calif.
Filed June 24, 1968, Ser. No. 739,426
Int. Cl. B22c *9/22*; **A01k** *47/04*
U.S. Cl. 249—152 **7 Claims**



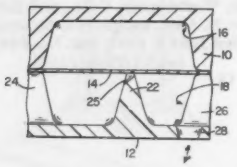
This disclosure describes a method of making a beeswax honeycomb of the type used by bees as a receptacle for honey. The honeycomb is made from a mold which includes an end wall, a peripheral wall and a plurality of at least partially collapsible core elements extending outwardly from the end wall and surrounded by the peripheral wall.

3,582,037

PNEUMATIC LOGIC ELEMENT CONSTRUCTION

George Napoleon Levesque, Warwick, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Filed Oct. 29, 1969, Ser. No. 872,303
Int. Cl. F16k 7/12; F15c 3/04
U.S. Cl. 251—61.1 2 Claims



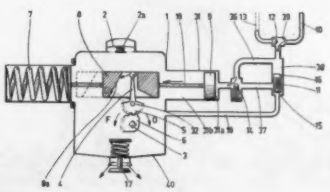
The disclosure of the invention is a ridge containing control chamber of a diaphragm-type pneumatic logic element having two plates stacked in facing relation and an interposed diaphragm, said control chamber comprising a supply pressure admission chamber recess formed in the face of one plate at one side of the diaphragm and a complementary ridge containing chamber recess with interconnecting channels to said ridge formed in the adjacent face of the other plate at the opposite side of the interposed diaphragm, in which the improvement is a control ridge, having a concaved curvature along its length to give more area for flow in the "ON" condition, and an upward taper to a sharp edge with an abrupt dropoff in the direction of flow which allows air flow to force the diaphragm away from the ridge to improve flow also in the "ON" condition.

3,582,038

SAFETY APPARATUS FOR REMOTE CONTROL OF VALVES

Jacques Harbonn, Jouars Ponchartrain, and Emile Levallois, Martigues, both of, France, assignors to Institut Francais Du Petrole, Des Carburants Et Lubrifiants, Rueil Malmaison (Hauts de Seine), France

Filed July 7, 1969, Ser. No. 839,536
Int. Cl. F16k 31/44
U.S. Cl. 251—71 10 Claims



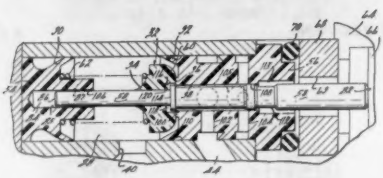
Safety apparatus for the remote control of valves, particularly valves controlling sluices or water gates disposed at the head of an underwater oil well, including means for effecting the opening of the valve in response to either a hydraulic or electrical signal emanating either from a central control location monitoring a plurality of valves or from a location associated with only a single valve, and maintaining the control system in an energized state until a signal is generated, either by a device monitoring certain flow parameters or by a manual control, to permit the system to be deenergized, thus causing the valve to return to a closed position.

3,582,039

INDUSTRIAL AIR VALVE WITH ELECTRICALLY OPERABLE PILOT VALVE HAVING MINIMAL SOLENOID LOADING

Harlan R. Cagle, Clarkston, Mich., assignor to Sahlin Engineering Company, Inc., Troy, Mich.

Continuation-in-part of application Ser. No. 635,545, May 18, 1967, now abandoned. This application Nov. 26, 1969, Ser. No. 880,061
Int. Cl. F16k 31/06
U.S. Cl. 251—129 6 Claims



There is herein disclosed an industrial-type air valve assembly in which poppet-type valve heads have a new and improved self-compensating sealing lip and are controlled by a new and improved solenoid operated pilot valve. The pilot valve is connected to an operating solenoid in a manner providing a noload gap between a valve stem and a valve head to reduce starting load. The valve stem is supported by plastic-bearing means providing minimal frictional loading to further reduce starting load. The valve stem and valve head cooperate to provide variable force transfer surfaces whereby pressure forces opposing movement of the solenoid armature are varied from a minimum pressure force prior to opening of the valve providing minimum resistance to the armature to a maximum pressure force immediately after opening of the valve to decelerate the armature to an intermediate pressure force to brake the armature as it bottoms.

ERRATUM

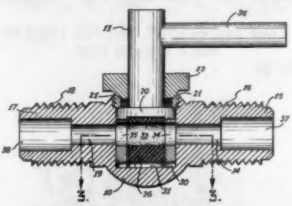
For Class 251—146 see:
Patent No. 3,582,006

3,582,040

COCK VALVE

Daniel Gutierrez, Sabinos 058, Jardines de San Mateo, Mexico

Filed July 18, 1967, Ser. No. 654,149
Claims priority, application Mexico, July 19, 1966, Apr. 26, 1967, 90038;95477
Int. Cl. F16k 5/06, 5/20, 25/100
U.S. Cl. 251—287 3 Claims



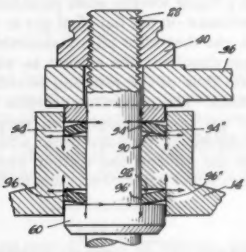
A cock valve comprising a cylindrical valve chamber completely closed at one end, and a composite plug within said chamber, said composite plug being provided with yieldable sealing means to seal against the cylindrical wall of the valve chamber, said plug having a diametral bore transverse to the length of said yieldable means to permit the flow of fluid through the valve in one position and to obstruct said flow in another position.

The open end of the valve chamber is sealed by a valve cap forming a packing gland with the upper portion of the plug

which is provided with a stem extending outwardly of said valve cap to enable the operation of the valve by turning it to the proper position.

The yieldable sealing means comprise a solid body of an elastomeric material forming an insert in the plug, or a pair of elastomeric members biased outwardly of the plug by means of a spring device, or a hollow cylindrical member of an elastomeric material surrounding the plug and biased outwardly at a portion thereof by the spring means.

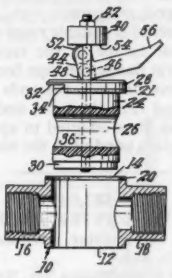
3,582,041
VALVE PACKING BOX ASSEMBLY
Werner K. Priese, Barrington, Ill., assignor to Hills-McCanna Company, Carpentersville, Ill.
Continuation-in-part of application Ser. No. 560,488, June 27, 1966, now abandoned. This application Feb. 14, 1969, Ser. No. 799,334
Int. Cl. F16k *5/00*
U.S. Cl. 251—304 **12 Claims**



A packing box assembly for a valve unit of the type including a body member having a passageway therethrough and an aperture in said body member communicating with said passageway, a valve element disposed within said body member for selective blocking and unblocking of said passageway, and stem means interconnected with said valve element for the operation thereof and extending outwardly through said aperture. The packing box assembly for said unit is comprised of a pair of annular seal ring seats axially spaced and disposed about said aperture, said seal ring seats cooperating with the stem to define seal ring-receiving chambers, and a seal ring disposed in each said chamber. Each said seal ring is in the form of a frustoconical member having cylindrical inner and outer peripheral surfaces, and being constructed of a resilient, plasticlike material. The seal ring members and the seal ring receiving chambers are constructed such that upon assembly of said seal rings in said chambers the cylindrical inner and outer peripheral surfaces of said rings will be in sealing engagement with the stem and the seal ring seat, respectively, and the drawing of said packing box assembly into tight sealing engagement places said seal ring members in compression. The packing box assembly also has the seal ring-receiving chambers disposed such that the compressive forces set up during final assembly will directly oppose and preclude rocking of the stem with respect to the body member.

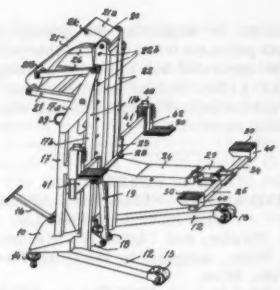
3,582,042
EXPANSIBLE PLUG VALVE
Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Worcester, Mass.
Filed Apr. 16, 1969, Ser. No. 816,555
Int. Cl. F16k *5/02*
U.S. Cl. 251—309 **7 Claims**

A valve including a body and a completely removable elastometric valve member therein, including means for expanding the valve member under normal usage thereof whether open or closed or in any position between, said means being releasable to allow removal of said valve



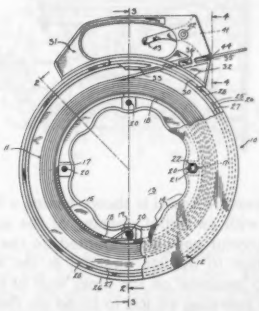
member from the valve body, said valve body being open at both sides, the valve member itself closing the openings.

3,582,043
MOBILE LOAD LIFTER
Jacques Tranchero, Villanovetta 2, Piasco, Italy
Filed July 25, 1969, Ser. No. 845,006
Claims priority, application Italy, July 26, 1968, 52593/68
Int. Cl. B66f *5/04*
U.S. Cl. 254—2 **6 Claims**



A mobile crane which may be used both as a fork trucklike device and as a vehicle-lifting machine. Special features of the crane are the pantograph means which couple two vertical frames and the double-T-shaped load support.

3,582,044
FISH TAPE REEL
James M. Gardner, Milwaukee, Wis., assignor to Gardner Bender, Inc., Milwaukee, Wis.
Filed June 11, 1969, Ser. No. 832,173
Int. Cl. E21c *29/16*
U.S. Cl. 254—134.3 **6 Claims**



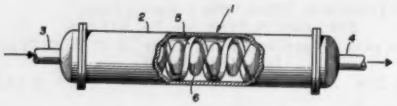
An annular reel for storing electricians' fish tape, and comprising a pair of interfitting, substantially identical sections

joined together near the central opening of the reel to permit access of the fish tape at the outer periphery of the reel between the sections. Each of the sections have a continuous groove defined by an inturned peripheral flange and an inwardly, radially spaced, concentric web. An elongated strip of relatively stiff material is slidably received in the groove to prevent unintentional escape of the tape between the opposed outer peripheral flanges. A tape feeder handle slidably received in the groove between the ends of the strip, and is arranged to guide and feed the tape, and further includes a finger-operated brake shoe adapted to apply pressure to the tape as it is forced into a conduit or the like.

3,582,045
POLYMER INTERMINGLER

Allen E. Leybourne, III, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 694,503, Dec. 29, 1967, now abandoned. This application Apr. 3, 1969, Ser. No. 820,698
Int. Cl. B01f *15/00*
U.S. Cl. 259—4 **1 Claim**

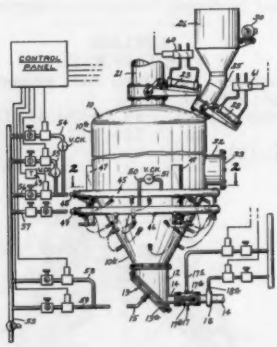


An apparatus for improving the homogeneity of molten heat sensitive polymers when the flow thereof is substantially laminar. The apparatus has a tubular housing into which is snugly fitted a first helical member, and into which is disposed a second helical member of such size as to fit inside the first helical member.

3,582,046
BLENDING AND TRANSPORTING APPARATUS FOR DISCRETE MATERIALS

Edward E. Mueller, and Marvin C. Mueller, both of Minneapolis, Minn., assignors to Whirl-Air-Flow Corporation, Minneapolis, Minn.

Filed May 15, 1969, Ser. No. 825,006
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **17 Claims**

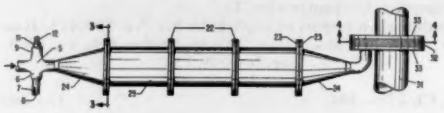


A closable pressure vessel is shown having a funnel-shaped lower portion with an outlet opening at the small diameter bottom end. Aerator pads are mounted on the inner wall of the lower portion to fluidize material in the vessel. Air jet fittings are also mounted on the inner wall of the lower portion to provide pulsating air jets to blend the fluidized materials in the vessel. A diffuser pad is mounted between said outlet opening and an outlet conduit to aid in fluidizing the materials during blending, and to aid in causing the blended materials to flow from the vessel through the outlet opening into the outlet conduit for transporting to a remote location.

3,582,047
METHOD OF DISSOLVING LIQUEFIED GAS AND APPARATUS THEREFOR

Udell T. Greene, Florham Park, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed June 12, 1969, Ser. No. 832,633
Int. Cl. B01f *1/00, 3/04*
U.S. Cl. 259—4 **5 Claims**

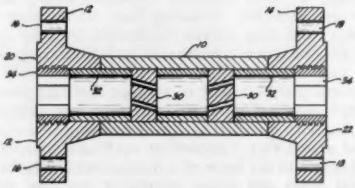


Dispersing apparatus achieves solution of a soluble liquefied gas in a liquid solvent while permitting at least substantially full pressure on the liquefied gas to the point of incipient solution and thereafter affords desirable dispersion of the liquefied gas dissolving the solvent as well as providing fast and efficient flow of the resulting solvent into a liquid-processing medium. The apparatus provides for suppressed vaporization of gas, even though such suppression occurs during an accompanying pressure drop, when the liquefied gas dissolves in the solvent, and further when the resulting solution disperses in the liquid-processing medium.

3,582,048
INLINE FLUID MIXING DEVICE

Amir M. Sarem, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 701,617, June 30, 1968, now abandoned. This application June 12, 1969, Ser. No. 839,768
Int. Cl. B01f *15/00*
U.S. Cl. 259—4 **10 Claims**



A device for installation in a flow conduit for mixing fluids flowing through the conduit. The device consists of an elongated body member containing a plurality of longitudinally spaced apertured mixing elements, the mixing elements being comprised of solid plugs having lengths equal to at least one quarter of their diameter and having a plurality of angularly disposed apertures therethrough. The angle of the apertures can be reversed in adjacent mixing elements to improve fluid mixing.

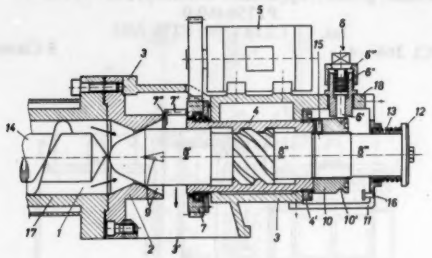
3,582,049
MIXING AND KNEADING DEVICE

Wilhelm G. Weber, and Fritz Sutter, both of Pratteln, Switzerland, assignors to Buss Aktiengesellschaft, Basel, Switzerland

Filed Sept. 26, 1968, Ser. No. 762,841
Claims priority, application Switzerland, Oct. 13, 1967, 14510/67
Int. Cl. B01f *15/02*
U.S. Cl. 259—45 **9 Claims**

Mixing and kneading device comprising a housing, a mix-

ing and kneading the chamber arranged in said housing which chamber has an annular nozzle type outlet, at least one wormshaft mounted in said mixing and kneading chamber and a closure device arranged coaxially to said wormshaft adjacent to said outlet. The closure device incorporates a closure spigot and means for rotating and reciprocating the closure spigot in the longitudinal direction of the axis of said wormshaft. The plugging end of the closures is directed towards the outlet of the kneading chamber and is fitted with a tensioning device operating in the opening direction, and comes under the influence of an arrester device which opens when a predetermined axial pressure has been attained.

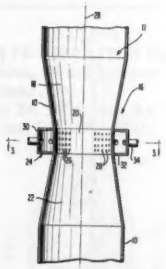


3,582,050

FLUID-HANDLING, GAS-SCRUBBING, AND BLAST FURNACE TOP PRESSURE CONTROL

Hiram C. Kozak, Lackawanna, N.Y., assignor to National Steel Corporation

Filed Sept. 27, 1968, Ser. No. 763,256
Int. Cl. B01f *3/04*
U.S. Cl. 261—36 **15 Claims**



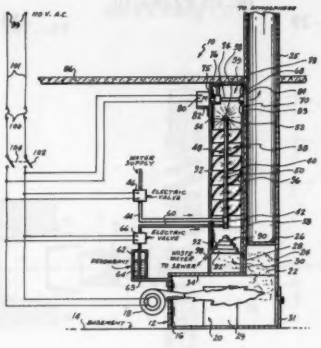
Venturi-scrubbing system for blast furnace effluent gases, embodies a fluid handling system in which pressure of fluid (including the effluent gases) flowing in a passageway in open communication with the blast furnace top, is controlled by injecting control fluid into the passageway to increase and decrease the effective transverse cross-sectional area of the passageway at the location of control fluid injection. The control fluid is injected at the throat of the venturi in response to sensed pressure in the passageway, to adjust the effective cross-sectional area of the throat to maintain a predetermined pressure drop across the venturi, or a predetermined pressure upstream or downstream of the venturi. By controlling pressure in the passageway, the blast furnace top pressure is controlled.

3,582,051

SMOKE CLEANING APPARATUS

Nicholas Klein, 2043 Creston Ave., Bronx, N.Y., and Yeshave Levy, 127 Penn St., Brooklyn, N.Y.

Filed Jan. 8, 1969, Ser. No. 789,828
Int. Cl. B05b *7/10*
U.S. Cl. 261—79 **10 Claims**



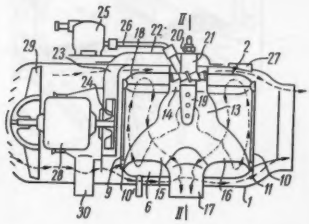
Apparatus for filtering and washing smoke containing solid particles passing upwardly from a furnace or incinerator to a chimney is described. One conical baffle assembly and helical baffles are interposed in a smoke cleaning stack or in the chimney. The conical baffles assembly strains the smoke. The helical baffles contain spray pipes which emit sprays of water into the smoke to entrain solid particles. The dirty water is drained out through the stack without passing through the conical baffles. The dirty water may be filtered and recirculated. A deodorant is discharged into the cleaned smoke before passing up the chimney. A blower forces the cleaned deodorized smoke up the chimney.

3,582,052

APPARATUS FOR HEATING GAS MEDIUM

Boris Dmitrievich Maltsev, Ulitsa Kominterna, 152; Boris Nikolaevich Pyatko, Prospekt B. Khmelnitskago 35, Lv. 17; Grigory Mikhailovich Veselov, Ulitsa Selyanskoya, 22, and Felitsian Felitsianovich Aparovich, Ulitsa Belyaeva, 73, all of Melitopol, U.S.S.R.

Filed Apr. 25, 1969, Ser. No. 819,197
Int. Cl. F23l *15/04*
U.S. Cl. 263—20 **5 Claims**



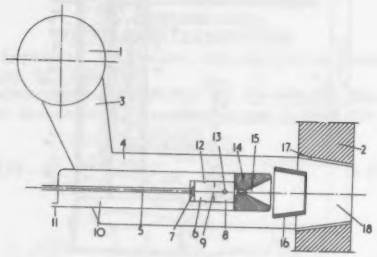
An apparatus for heating a gas medium, preferably for automobiles and the like, wherein exhaust gases of a combustion chamber are used as the heat-carrying agent, the apparatus being much more compact than those found in the prior art, without a decrease of thermotechnical characteristics, due to the interconnection of the combustion chamber and heat exchanger.

3,582,053

METHOD AND APPARATUS FOR INJECTING LIQUID FUEL INTO A SHAFT FURNACE

Raymond George Limpach, Esch sur Alzette, Grand-Duchy, Luxembourg, assignor to Centre National De Recherches Metallurgigues, Brussels, Belgium

Filed Feb. 25, 1969, Ser. No. 802,117
Claims priority, application Luxembourg, Feb. 28, 1968, 55572
Int. Cl. F27b *1/10*
U.S. Cl. 263—29 14 Claims



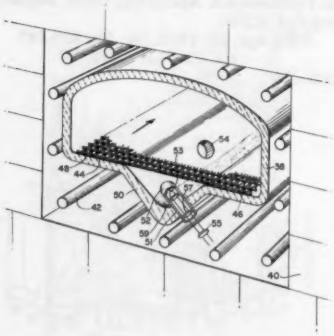
A method for the injection of a liquid fuel into a shaft furnace, in which a jet of fuel is introduced into a chamber where it is atomized by a jet of compressed gas. The mixture of fuel and gas is then passed through at least one further chamber in which a further jet of compressed gas completes the atomization of the fuel. The mixture is then caused to converge and then diverge before being subjected to the action of a hot oxidizing gaseous fluid, whereby the fuel is burned before being injected into the furnace.

3,582,054

FURNACE MUFFLE

Jacob Howard Beck, Waban, Mass., assignor to BTU Engineering Corporation, Waltham, Mass.

Filed June 4, 1969, Ser. No. 830,476
Int. Cl. F27b *21/04*
U.S. Cl. 263—47 6 Claims



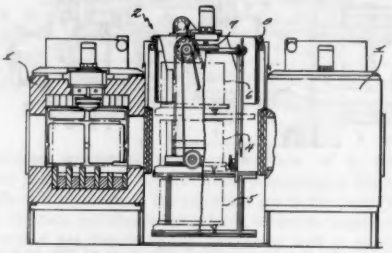
A furnace muffle operative to maintain a clean atmosphere over a wide temperature range. The muffle is formed of fused silica with a flat hearth adapted to directly support a moving conveyor. The muffle includes a downwardly extending V-shaped portion formed along the length of the hearth arranged to hold one or more temperature sensing thermocouples with a minimum of lead-length and to collect contaminants in an area removed from workload being processed.

3,582,055

FURNACE PLANTS FOR HEAT TREATMENT OF WORKPIECES UNDER PROTECTIVE GAS ATMOSPHERES

Karl-Heinz Winter, Dornigheim; Friedrich Eysell, Frankfurt am Main, and Rolf Schuster, Hanau (Main), all of, Germany, assignors to Deutsche Gold-und Silber Sheideanstalt normals Rossler, Frankfurt, am Main, Germany

Filed June 5, 1969, Ser. No. 830,729
Claims priority, application Germany, June 5, 1968, P1758460.0
Int. Cl. C21d *1/00*; F27b *9/02*
U.S. Cl. 266—4 5 Claims



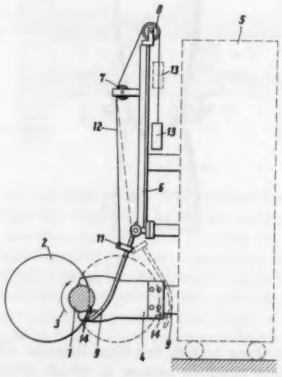
Furnace plants for the heat treatment of metal workpieces under protective atmospheres are provided with one prechamber servicing two or more heat treating chambers.

3,582,056

APPARATUS FOR COOLING THE CRANK WEBS OF CRANKSHAFTS DURING INDUCTIVE HARDENING

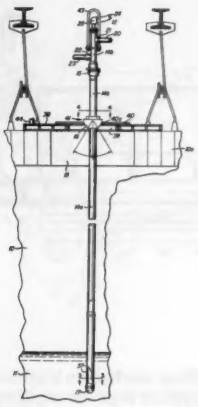
Gerhard Preyer, Wermelskirchen, Germany, assignor to Deutsche Edelstahlwerke Aktiengesellschaft, Krefeld, Germany

Filed Oct. 14, 1968, Ser. No. 767,184
Claims priority, application Germany, Dec. 23, 1967, P 15 83 356.4
Int. Cl. C21d *1/62*
U.S. Cl. 266—6 4 Claims



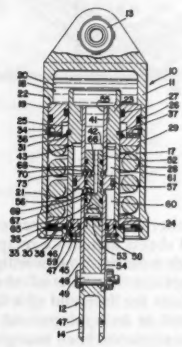
When inductively heating crankshaft workpieces, there is a tendency for the crank webs to become locally overheated during heating of crankpin portions of the rotating crankshaft workpieces. This is overcome by the invention by the provision of a cooling arm which is pivoted in the manner of a pendulum, and which is biased for motion towards the crankpin during rotation of the crankshaft, whereby the webs are effectively cooled during the portion of revolution of the workpiece when they tend to become overheated.

3,582,057
OXYGEN LANCE
George C. Beals; Kendal M. Ogilvie, both of Salt Lake City, Utah, and Lyle E. Mulholland, Hayden, Ariz., assignors to Kennecott Copper Corporation, New York, N.Y.
Division of Ser. No. 496,119, Oct. 14, 1965, Pat. No. 3,436,068
Filed Dec. 20, 1967, Ser. No. 721,892
Int. Cl. C21c 7/00
U.S. Cl. 266—34 2 Claims



An oxygen lance for the injection of oxygen into a molten material. The lance includes an elongate tubular shank and a gas-injection tip, the lower portion of the shank proximate the tip being circular and provided with longitudinal, solid formations projecting outwardly therefrom for anchoring frozen, i.e. solidified, portions of molten material in which such lower portion of the shank is immersed. A universal pendulous mounting is provided to support the lance from a furnace roof, and a hose or other flexible means is secured to the upper portion of the shank for supplying oxygen. Such a construction permits the lance to swing when contacted by solid masses floating in the molten material.

3,582,058
LINEAR-TYPE VIBRATION DAMPENER
Louis A. Hodges, Tulsa, Okla., assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Apr. 24, 1968, Ser. No. 725,263
Int. Cl. B60g 15/02
U.S. Cl. 267—34 13 Claims

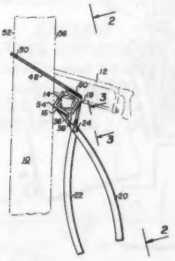


A linear-type vibration dampener having liquid and spring resistance means acting in series and with the spring means telescoped over the liquid means for minimum overall length of the dampener.

3,582,059
TELESCOPIC SHOCK ABSORBER
Christiaan Mihai Van Ooy, Rotterdam, Netherlands, assignor to Arie Adrianus de Konig, Paradijsweg, Oud-Beijerland, Netherlands and Kornelis Korstiaan Karel de Konig, Kwaksiweg, Oud-Beijerland, Netherlands, part interest to each
Filed May 14, 1969, Ser. No. 834,577
Claims priority, application Netherlands, May 14, 1968, 68/06,812
Int. Cl. B60g 11/56
U.S. Cl. 267—34 3 Claims

A shock absorber comprising two telescoping sections each including a spring washer for supporting the ends of a helical compression spring made of wire coaxially wound about the shock absorber and freely movable relative to it, wherein the wire of the compression spring is provided with at least one roller-shaped guide member coaxial with the wire and rotatable about it.

3,582,060
CONDUIT-CUTTING TOOL
Herschel B. Carter, 2033 West Mulberry Drive, Phoenix, Ariz.
Filed July 9, 1969, Ser. No. 840,175
Int. Cl. B25b 7/02, 3/00
U.S. Cl. 269—2 8 Claims



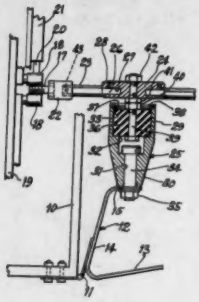
A conduit-cutting tool generally comprising pliers having a pair of opposed jaws with slots therein adapted to receive a hacksaw blade therethrough, said jaws being adapted to hold a conduit in position to be cut when said hacksaw blade is reciprocated through said slots; and a brace bar coupled to one jaw of said pliers and adapted to be hooked around a stud or rafter in opposition to the opposite one of said jaws, whereby the pliers may be braced in such a manner that the jaws will be forced together and held steady, while the saw blade is reciprocated through said slots to accurately cut off a conduit between said jaws.

3,582,061

PARTS HOLDER FOR TAPE WRAPPING MACHINE

Egons Inka, Chicago, Ill., assignor to Crane Packing Company, Morton Grove, Ill.

Filed Nov. 5, 1968, Ser. No. 773,456
Int. Cl. B23q 5/22; B65h 81/02
U.S. Cl. 269—57 8 Claims



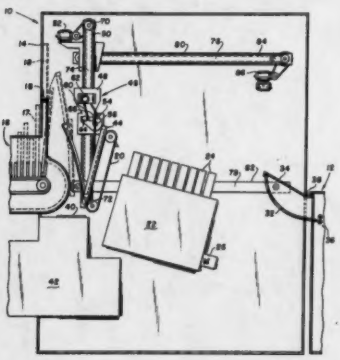
In a machine for wrapping unsintered polytetrafluoroethylene tape around threaded recessed plugs or the like, a turret-type feed mechanism for the plugs which is designed to provide flexibility in the holder for the plugs so that if the machine and plug are not concentric, the holder will yield universally to allow the plug to follow the machine gyrations.

3,582,062

AUTOMATIC CASSETTE LOADER AND UNLOADER FOR SHEET FILM

Patricia M. Andrus, and Charles J. Kunz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1969, Ser. No. 794,032
Int. Cl. B65h 5/10
U.S. Cl. 271—5 3 Claims



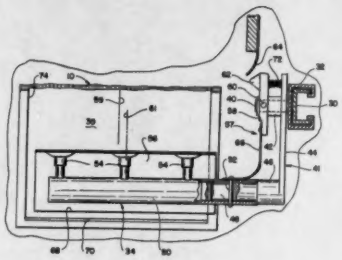
A machine for automatically unloading sheet material from a cassette, depositing the removed sheet material in a receptacle, removing another sheet of material from a storage magazine and reloading the cassette with the latter sheet material. The machine includes a pickup device for selectively grasping the sheet material and a transport mechanism for moving the pickup device between the cassette, the receptacle and the magazine.

3,582,063

FILM SHEET POSITIONING MECHANISM FOR CASSETTES AND METHOD OF USE

Oliver W. Gnage, and Norman N. Lareau, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1969, Ser. No. 794,313
Int. Cl. B65h 5/10
U.S. Cl. 271—5 15 Claims



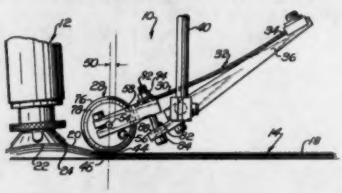
A film sheet pickup mechanism includes a telescopic tube having vacuum supplied cups for engaging a film sheet supplied from a magazine. The pickup mechanism moves the film sheet towards an open cassette with the vertical centerline of the sheet laterally displaced from that of the cassette and the horizontal centerline of the film sheet higher than the corresponding centerline of the cassette. After the sheet has partially entered the cassette, a cam and follower mechanism moves the sheet into lateral alignment with the cassette, the sheet dropping to the bottom of the cassette when the vacuum supply to the cups is removed.

3,582,064

SHEET COMBER

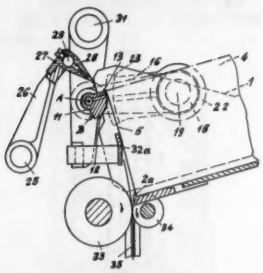
William H. Weidman, Independence, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Dec. 23, 1968, Ser. No. 785,931
Int. Cl. B65h 3/46
U.S. Cl. 271—19 8 Claims



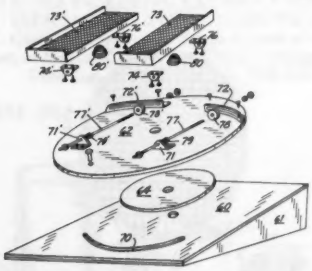
An improved comber assembly for removing sheets one at a time from a pile of sheets includes a reciprocatable pushrod for moving a comber member downwardly into engagement with an upper sheet on the pile of sheets. The comber member is mounted on the free end of a leaf spring which is operatively connected at an opposite end with the pushrod. After the comber member has been brought into engagement with the upper sheet, the spring is deflected by continued downward movement of the pushrod. This deflection of the spring presses the comber member both downwardly and sidewardly to move the upper sheet relative to the next adjacent lower sheet. The sideward movement causes the upper sheet to tend to buckle upwardly so that it is slightly separated from the next adjacent lower sheet.

3,582,065
DEVICE FOR SEPARATING INDIVIDUAL LABELS FROM A STACK OF LABELS
Pierre Luginbuhl, Neuhausen Am Rheinfall, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen Am Rheinfall, Switzerland
Filed Nov. 14, 1969, Ser. No. 876,851
Claims priority, application Switzerland, Nov. 19, 1968, 17236/68
Int. Cl. B65h *3/10*
U.S. Cl. 271—29 4 Claims



A device for separating individual labels from a stack of labels which is caused to move downwardly in an inclined feed channel against a movable pressure plate and an abutment engaging the lower edge of the stack. A pivotally mounted suction head has a curved outer surface is caused to roll along the foremost label on the stack to lift the upper edge of the label, whereupon a wedgelike member equipped with air blast channels is inserted in the gap formed between the lifted edge of the label and the stack to completely separate the label from the stack. The separated label is ejected by conveyor rollers downwardly from the device.

3,582,066
SKI TRAINER AND EXERCISER
Horace Theodore Keryluk, 5150 East Laurel, Boulder, Colo.
Continuation of application Ser. No. 494,380, Oct. 11, 1965, now abandoned. This application Sept. 27, 1968, Ser. No. 781,661
Int. Cl. A63b *69/18*, *23/04*
U.S. Cl. 272—57 6 Claims



A ski-simulating device which includes an inclined base having a platform mounted for rotation thereon. A pair of foot pedals are tiltably mounted on the platform about an axis parallel to their lengths, and situated with the axis of rotation of the platform located within the area defined by and between the pedals (so the center of gravity of the person standing thereon is distributed generally over said axis). Preferably spring means urge the pedals against being tilted inwardly toward one another. They also can be independently slidable in the lengthwise direction to allow either foot to advance slightly beyond the other to simulate the parallel ski technique, and/or angularly movable with respect to each other to allow "stemming."

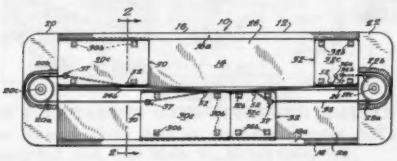
3,582,067
EXERCISING WEIGHT FOR ICE SKATES OR THE LIKE
Ernest S. Rucks, 410 Bale St., Santa Ana, Calif.
Filed May 15, 1969, Ser. No. 824,792
Int. Cl. A63b *23/04*
U.S. Cl. 272—57 8 Claims

An exercising weight for attachment to the arch portion of an ice skate or the like by means of straps buckled across the instep of the shoe of the skate. A weight element is enclosed in a sheath of unitary construction with integral straps. The weight element is completely enveloped by the sheath by means of multiple cemented overlapping flaps.

3,582,068
CHANNEL-SHAPED BALANCING DEVICE
Lennart Hallgren, and Orvar Rikardson, both of Halmstad, Sweden, assignors to Aktiebolaget Skrivrit, Backvagen, Sollentuna, Sweden
Filed Oct. 10, 1968, Ser. No. 766,593
Int. Cl. A63b *23/04*
U.S. Cl. 272—60 9 Claims

A balancing device comprising an elongated downwardly open channel-shaped member, end walls closing the ends of the channel, and a rod extending longitudinally in the channel between the end walls. The channel is turnably mounted on the rod; and support legs adapted to engage the ground are rigidly attached to the rod. The arrangement is such that the turning movement of the channel-shaped support member is limited in either direction about the rod.

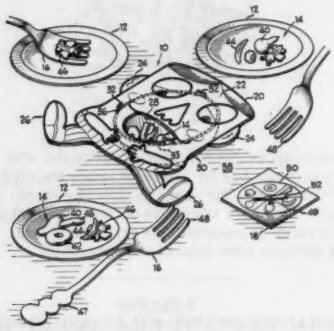
3,582,069
CRAWLER-TYPE EXERCISING DEVICE
Francis S. Flick, Bensenville, and Edward R. Burke, Hoffman Estates, both of, Ill., assignors to Flick-Reedy Corporation
Filed Oct. 21, 1968, Ser. No. 769,068
Int. Cl. A63b *21/00*
U.S. Cl. 272—79 5 Claims



An improved linkage or coupling arrangement for an exercise apparatus of the creeping and crawling type having pairs of pads mounted for to-and-fro parallel movement in each of pairs of adjacent channels, wherein the diametrically opposite pads simultaneously move in the same direction and pairs of pads move toward and away from each other, characterized by a single cable strand reeved about two pulleys or drums or two separate strands reeved about two

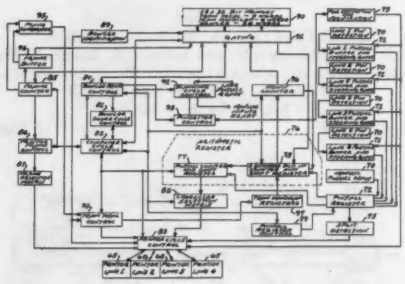
spaced pairs of pulleys and interconnecting all of the four pads for such movement or rigid linkage means for interconnecting the pads.

3,582,070
GAME WITH TILTABLE RECEPTACLE
Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 13, 1968, Ser. No. 783,527
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 **6 Claims**



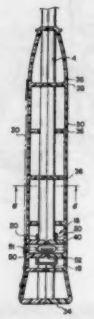
Game apparatus including a rockably supported target member having an enlarged mouth opening forming a target and an underlying receptacle having a curved bottom wall providing the rockable support for the target. A number of different simulated food item playing pieces are distributed to the game players and conveyed to the mouth opening, using an element stimulating an oversized fork. A chance device is provided to indicate the particular food item to be conveyed by the game players.

3,582,071
BOWLING SCORING SYSTEM
Herbert D. Grosvenor; Robert Torresen, both of Muskegon, Mich., and Jerome F. Walker, Kirtland, Ohio, assignors to Brunswick Corporation
Filed Jan. 30, 1967, Ser. No. 612,568
Int. Cl. A63d *5/00*
U.S. Cl. 273—54 **13 Claims**



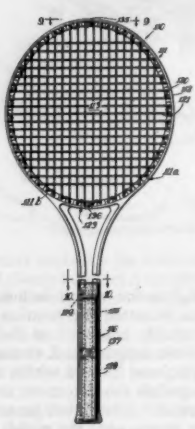
An automatic bowling scoring system for multiple lane use including a single computer and associated peripheral systems including provisions for handling such situations as (1) out of range pins; (2) illegal balls; (3) the spotting of a new setup of pins without computer cycling; (4) error correction and handicap entry through a single system; (5) erroneous attempts to change bowler identification before the bowler completes a frame; (6) the lack of bowler identification; (7) peculiar 10th frame situations; and (8) erroneous bowler identification; and which further includes time saving features as printer positioning extrinsically of computer operation and the permitting of a bowler to bowl the second ball in a frame even if the computer has not utilized the first ball information.

3,582,072
RACKET HANDLE
David D. Stueck, 62 Leuning Street, South Hackensack, N.J.
Filed Sept. 27, 1968, Ser. No. 763,112
Int. Cl. A63b *49/08*
U.S. Cl. 273—73(J) **7 Claims**



A racket for tennis or like games having a metal tubular frame bent to provide a loop and depending handle arms, brace means interconnecting the arms adjacent their lower ends, grip members positionable on the arms to provide a handle structure, the grip members and brace having cooperating stud and stud receiving openings for positioning and holding the grip member, locking means for interconnecting the grip member studs, torsion preventing brace means adjacent the loop and sheathing means on the loop.

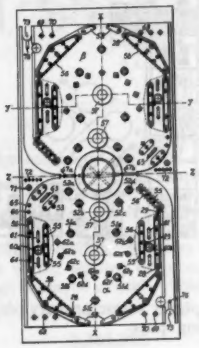
3,582,073
CAST METAL RACQUET WITH OFFCENTER STRING GUIDES
Samuel H. Melnick; Samuel W. Landsman, and Walter A. Stromski, all of Chicago, Ill., assignors to Midland Merchandise Corporation
Filed June 20, 1968, Ser. No. 738,634
Int. Cl. A63b *49/12*
U.S. Cl. 273—73 **7 Claims**



A high strength cast metal racquet wherein string guides protrude into the striking area of the racquet frame but are

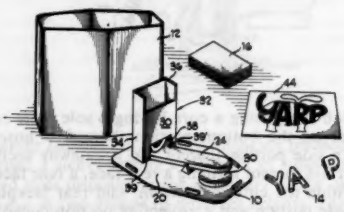
offset from the plane of the strings. The string guides contain apertures perpendicular to the plane of the strings. The string guides permit the strings to be strung in a plane bisecting the frame of the racquet.

3,582,074
SURFACE BALL GAME WITH OPPOSITELY INCLINED PLAYING SURFACES
Vincenzo Menotti, Via Valerio Laspro 7, 84100 Salerno, Italy
Filed July 30, 1968, Ser. No. 748,739
Claims priority, application Italy, Aug. 10, 1967, June 7, 1968, 31334/67;37547/68
Int. Cl. A63f *9/14*; A63b *37/00*
U.S. Cl. 273—86 **15 Claims**



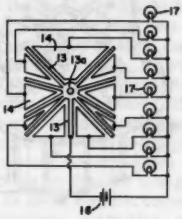
An electromechanical game consisting of two play fields, sloped in opposite directions, in which are provided holes, doors and bumper elements, in addition to electrical devices; on each field a ball is moved around by gravity or by mechanical impacts, conferred to it by the player, with said bumper elements, in order to hit determined targets for marking points. The players play one at a time, and each of them has the possibility of capturing the ball being played by the opponent, increasing the number of the balls at his disposal. The scores computed by a differential adder are indicated by toy cars which run on circular paths in a simulated race.

3,582,075
WORD GAME INCLUDING CATAPULT MEANS AND INDICIA-DISPLAYING PROJECTILES
Marvin I. Glass, and Jeffrey D. Breslow, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 2, 1969, Ser. No. 788,514
Int. Cl. A63b *71/00*
U.S. Cl. 273—95 **3 Claims**



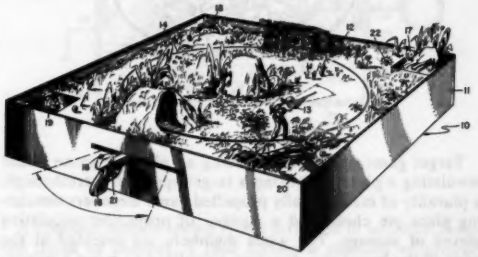
Apparatus for playing a word game comprising a number of alphabet letter projectiles, game cards bearing words, and a catapult. The letters are selected from a storage receptacle, and during each player's turn, one letter is launched into the air by the catapult. The other game players attempt to recognize and catch the launched letter in midair if that letter is necessary for completion of a game word.

3,582,076
ELECTRICAL SCORING GAME
Christian A. Keller, 4008 Villa Nova Road, Baltimore, Md.
Filed Feb. 24, 1969, Ser. No. 801,319
Int. Cl. F41j *5/04*
U.S. Cl. 273—95R **4 Claims**



A target board having a set of electrically conductive strips radiating from its center and also having a set of electrically conductive segments disposed between and electrically isolated from the strips. A set of score indicating lamps is connected in series with the respective segments to a source of current which is also connected to all the strips in a normally open circuit. A plurality of electrically conductive projectiles are adapted to be thrown on the target board to bridge the segments and strips for closing the circuit through one or more of the lamps. The projectiles are bean bags with electrically conductive covering.

3,582,077
COMBINED MOVABLE SHOOTING FIGURE AND TARGET
Edward I. Parker, 34 Oak Ridge Road, Holden, Mass.
Filed Oct. 3, 1968, Ser. No. 774,561
Int. Cl. A63f *9/02*
U.S. Cl. 273—101.2 **12 Claims**

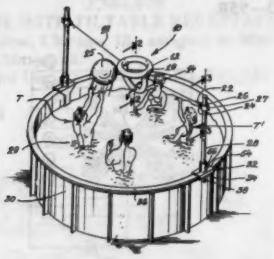


A combined movable shooting figure and target wherein the figure is driven along a plane closed path and various targets are positioned around the path. The targets automatically appear during the movement of the shooting figure while the player controls not only the aspect of the figure relative to the target but also the time of shooting.

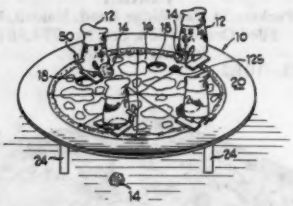
3,582,078
HOOP BALL TARGET WITH ATTACHED DEFLECTOR
Michael Katras, 22-10 94th St., Jackson Heights, N.Y., and Domenick J. Risi, East Main St., Shrub Oak, N.Y.
Filed Sept. 25, 1969, Ser. No. 860,959
Int. Cl. A63b *63/00*
U.S. Cl. 273—102.4 **10 Claims**

A hoop ball game has a main ring for passing a ball therethrough. The ring is suspended in an elevated, horizontal position between two posts by supporting lines. A deflector carried by the ring deflects the ball after passing through the ring. The deflector may be a U-shaped member depending from the ring in a diametral plane of the ring, or the

deflector may be another ring of smaller diameter joined by detachable rods to the main ring. The main ring and deflector may be made of inflatable tubing, flexible rubber or plastic, wood or metal.



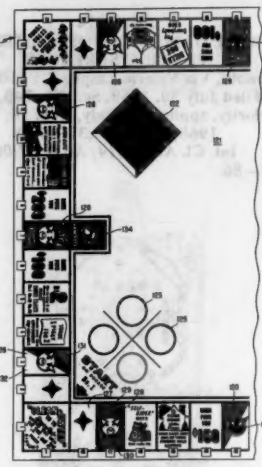
3,582,079
GAME INCLUDING MECHANICAL PROJECTORS, PROJECTILES, AND TARGET
Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 7, 1969, Ser. No. 797,522
Int. Cl. A63b *71/00*
U.S. Cl. 273—108 **7 Claims**



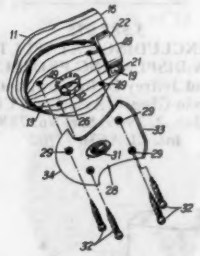
Target game apparatus including an elevated game board simulating a pizza pie having a target aperture therethrough, a plurality of mechanically propelled game members simulating pizza pie chefs, and a number of projectiles simulating pieces of sausage. The game members are oriented at the edge of the board in a direction calculated to move a projectile through a target aperture, and thereafter operate in a generally unassisted manner.

3,582,080
BOARD GAME APPARATUS
Frank J. Schick, 1925 Curdes Ave., Fort Wayne, Ind.
Filed May 2, 1968, Ser. No. 726,189
Int. Cl. A63f *3/02*
U.S. Cl. 273—134AD **1 Claim**

A game arrangement in which a printed board or sheet is provided with a row of playing spaces around the margin to form a continuous playing path along which playing pieces are moved with the amount of each move being determined by casting dice. The playing pieces consist of a primary playing piece for each player, each primary piece being a different color, and secondary playing pieces adapted to be placed on the primary playing pieces to travel therewith along the playing path. The playing spaces provide for rewards and penalties when a primary playing piece lands thereon and includes color coated spaces which offer particular rewards when a primary playing piece of a corresponding color lands thereon. When secondary playing pieces are resting on primary playing pieces, the value of certain reward spaces is increased. Special playing pieces are utilized which are associated with particular playing spaces, and a stack of instruction cards is also utilized from which a card is drawn by a player whose primary playing piece lands on a particular playing space.



3,582,081
GOLF CLUB WITH ADJUSTABLE WEIGHTS AND RECESSED FACE PLATE
David Morton Caplan, Los Angeles, Calif., assignor to AMF Incorporated
Continuation of application Ser. No. 602,691, Dec. 19, 1966, now abandoned. This application July 18, 1969, Ser. No. 852,960
Int. Cl. A63b *53/04, 53/08*
U.S. Cl. 273—171 **3 Claims**



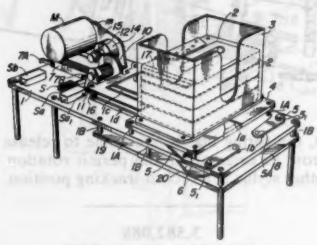
A golf club comprising a core having a sole plate register hole formed on the bottom portion thereof, a hosel hole formed on a side portion thereof and a cutaway section on the face portion thereof forming a rear face, a rear face plate mounted within the cutaway portion, said rear faceplate including a base portion and a projecting portion consisting of two sidewalls and an apertured center portion extending outwardly from the base portion, a weight mounted within the sole plate register hole, a sole plate mounted to the bottom portion of the core, said sole plate having an apertured projecting portion extending outwardly therefrom to engage the sole plate register hole, a predetermined swing weight mounted within the apertured portion of the sole plate, and a shaft having one end portion mounted within the hosel hole in the core.

3,582,082

TAPE CARTRIDGE AUTOMATIC EXCHANGE DEVICE

Isamu Takagi, and Atushi Shino, both of Tokyo, Japan, assignors to Aiwa Co., Ldt., Tokyo, Japan

Filed Jan. 22, 1968, Ser. No. 699,595
Claims priority, application Japan, July 22, 1967, 42/47133
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 3 Claims



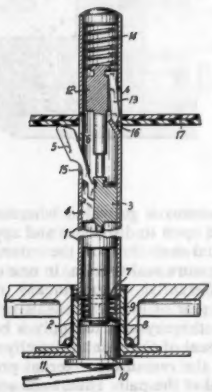
A tape cartridge automatic exchange device for automatically supplying a number of magnetic tape cartridges stacked in a magazine to a predetermined playing or recording position one after another for playing or recording, in such a manner that the lowermost tape cartridge is placed in said playing or recording position, removed from said position upon completion of the playing or recording and then the next tape cartridge is placed in said position.

3,582,083

PILE AXLE

Helmut Laufer, St. Georgen, Black Forest, Schwarzwald, Germany, assignor to Firma Dual Gebruder Steidinger, St. Georgen, Black Forest, Germany

Filed Feb. 19, 1969, Ser. No. 800,508
Claims priority, application Germany, Feb. 29, 1968, P 16 22 055.6
Int. Cl. G11d *17/04*
U.S. Cl. 274—10 2 Claims



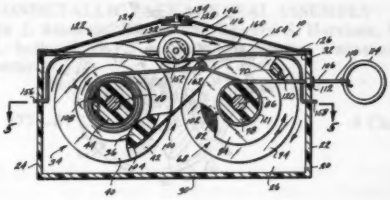
A center spindle for a record-changing phonograph which comprises a sleeve having a plurality of substantially axially directed slots disposed at the periphery of the upper part of the sleeve in two groups of different heights. Furthermore, a primary control means is disposed axially displaceable in the upper part of the sleeve, and a plurality of primary record-supporting means is movably connected with the primary control means and disposed in an upper group of the slots. The sleeve has an inwardly projecting inclined portion in the upper group of the slot and the inclined portion defines an inclined engagement face. The primary record-supporting means cooperates with the inclined face to push radially out of the sleeve the primary record-supporting means during downward movement of the primary control means. First spring means engage the sleeve and the primary control means and urge the latter with pretension into its lower position. A secondary control means is displaced axially displaceable in the sleeve below the primary control means. A plurality of secondary record-supporting means is movably connected with the secondary control means and is disposed in a lower group of the slots at a height below the primary supporting means for about the thickness of a record. The lower edge of the lower group of slots cooperates with the secondary record-supporting means, to withdraw the latter during downward movement of the secondary control means within the sleeve. Second spring means connect operatively with the sleeve and with the secondary control means and urge the latter with pretension into its lower position, and the primary and the secondary control means are disposed at a distance from each other, so that the lifting of the secondary control means from its lower position causes at first the projection of the secondary supporting means from the periphery of the sleeve, until its remaining path in upward direction the primary control means joins the upward movement.

3,582,084

DEVICE FOR REPRODUCING RECORDED SOUNDS IN TOYS

John W. Ryan, Bel Air, and Richard Shih-Teng Chang, Gardena, both of, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 17, 1966, Ser. No. 595,132
Int. Cl. G11b *25/06*
U.S. Cl. 274—11 7 Claims



A constant tension spring motor arranged to advance, from one drum to another, a tape having a plurality of groove sound tracks, a needle and speaker reproduces the sound from one of the tracks when the tape advances in one direction but is free of the tape when it is returned in the other direction. A drawstring is used to wind the motor and return the tape in the other direction and tension in the drawstring also acts to retract the tape from contact with the needle.

3,582,085

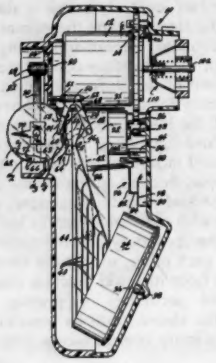
SOUND-TRANSLATING APPARATUS

Gordon H. Buck, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Mar. 5, 1969, Ser. No. 804,491
Int. Cl. G11b *25/06*
U.S. Cl. 274—11A 13 Claims

A continuous loop tape has a plurality of sound sequences in prerecorded phonograph record grooves terminating in a single runout groove. Sound-reproducing means include a tone arm having phonograph needle engageable with the grooves as said tape is advanced. An indexing wheel driven in timed relation to the tape has a cam segment and can be rotated to a selected position which locates the cam segment a given circumferential distance from a lever engaging the tone arm. When the tape starts the indexing wheel turns and,

as the cam segment engages the lever, the tone arm is lifted and dropped in an area on the tape corresponding to the



desired groove. The indexing wheel then ceases to turn so as not to continually lift the tone arm during play.

3,582,086

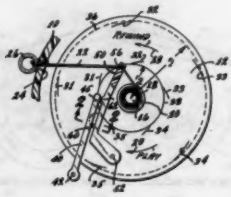
TONE ARM POSITIONING ARRANGEMENT IN A TOY SOUND REPRODUCING DEVICE

William F. Summerfield, Huntington Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 30, 1969, Ser. No. 795,194

Int. Cl. G11b *3/10*

U.S. Cl. 274—14 **11 Claims**



An arrangement in a toy sound reproducing device including a pivotally supported lever which at the end of Play is biased away from the record to automatically disengage the stylus of a tone arm from the record. During Rewind, a manually operable drawstring pivots the lever to an outward position. The lever carries the tone arm therewith. When the lever reaches its outward position, the tone arm is automatically disengaged from the lever to enable the stylus to engage the record even before Play begins.

3,582,087

DUAL-STYLUS PHONOGRAPH CARTRIDGE

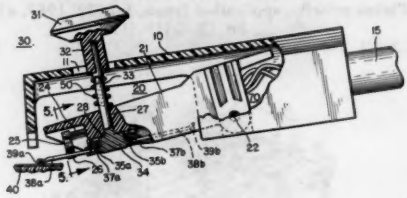
David Bella, Northlake, and Seymour Kessler, Wilmette, both of, assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 22, 1969, Ser. No. 818,258

Int. Cl. G11b *3/02*

U.S. Cl. 274—37 **3 Claims**

A phonograph cartridge having a dual-stylus assembly of the turret type wherein one stylus is designed to track stereo record grooves and the other stylus is designed to track monaural record grooves. The cartridge housing has a vertical opening therein and a recessed portion at the base of the opening which forms a seat. A turret shaft is supported in the opening and is axially and rotatably movable therein. The shaft has a pair of cantilever stylus support arms attached to its free end. The turret assembly is adapted for rotation to a predetermined orientation in order to selectively place one of the styli in a record tracking position. A spring is provided for biasing the turret shaft axially and upwardly into the seat to releasably maintain this orientation. Two cam surfaces are provided at the base of the turret shaft to operatively engage the sidewalls of the seat such that, upon mere rotation of the



turret shaft, the spring bias is overcome to release the turret assembly from its orientation and permit rotation thereof to place the other stylus in a record-tracking position.

3,582,088

SEALING APPARATUS

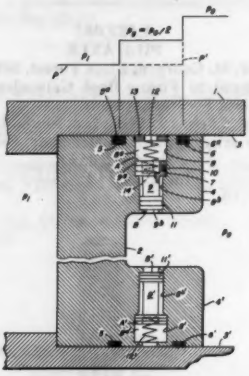
Tadayoshi Matsuzaki, and Yukihisa Fukumoto, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed July 16, 1968, Ser. No. 745,291

Claims priority, application Japan, July 25, 1967, 42/47771

Int. Cl. F16r *41/00;* **F16j** *15/00*

U.S. Cl. 277—3 **12 Claims**



Sealing apparatus is provided wherein differential piston means is relied upon to distribute and apportion among each of the individual seals thereof, the external pressure applied to the high-pressure seal therein. In one embodiment of such apparatus, differential piston means may be positioned between each pair of individual seals present in the sealing apparatus and thereby acts to apply a back pressure to the high-pressure seal of the pair to thereby reduce the pressure thereon while the remaining external pressure is applied to the second seal of the pair. Thus, each seal present in sealing apparatus according to this invention shares the applied pressure load.

3,582,089

PACKAGE ROTATING SHAFT SEAL ASSEMBLY

Franklyn J. Amorese, Hilton, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

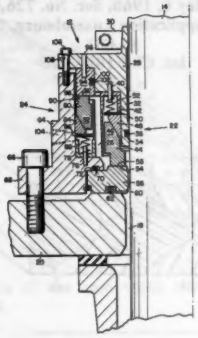
Filed Apr. 14, 1969, Ser. No. 815,606

Int. Cl. F16j *9/00, 15/00*

U.S. Cl. 277—38 **6 Claims**

A rotating compact package seal assembly is disclosed, the seal being designed as a double mechanical seal with one seal mounted concentrically inside the other seal. The compact seal of the invention is thereby approximately one-half the

package height of a conventional double mechanical seal and contains means whereby the inner and outer seals may be connected together for easy removal of the seal assembly as a



unit thereby providing a seal assembly that may be bench assembled, tested, and stocked on the customer's shelf as a pretested assembly which may be later installed with a minimum of downtime.

3,582,090

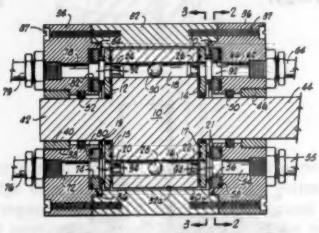
FACE SEAL STRUCTURE

Jerry L. Lott, and Hadi T. Hashemi, both of Norman, Okla., assignors to E-C Corporation, Dallas, Tex.

Continuation-in-part of application Ser. No. 598,423, Dec. 1, 1966, now Patent No. 3,431,747. This application Nov. 6, 1968, Ser. No. 773,837

Int. Cl. F16j *15/16*

U.S. Cl. 277—63 **15 Claims**



A face seal structure for sealing around intermittently communicating ports formed through two parallel planar faces which move relative to each other due to the rotation of one of the faces about a rotational axis extending substantially normal thereto. The seal structure includes a rigid seal plate between the faces and having parallel planar surfaces which are parallel to the faces. The seal plate is keyed to a first of the faces and has at least one opening through it which is aligned with a port through the face to which it is keyed, and which is periodically alignable with at least one port through the second face. A first sealing element of high shear strength and having a flat bearing surface of low coefficient of friction sealingly engages the second face, and is secured on one of the surfaces of the plate around the opening therethrough. A second sealing element is positioned between, and sealingly engages, the seal plate and the face to which the plate is keyed. Each of the first and second sealing elements defines an area within itself which includes the opening through the plate, and each is geometrically configured and located around the opening through the plate so that minimum force due to the pressure of fluid passed from one port to the other through the opening in the plate acts at all times during relative movement between the faces to bias the first sealing element into sealing contact with the second face.

3,582,091

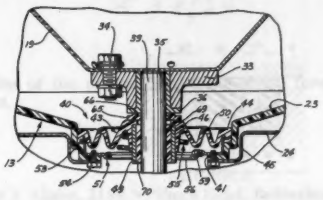
SEAL CONSTRUCTION FOR FLUID EXTRACTOR

Thomas R. Smith, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Dec. 18, 1969, Ser. No. 886,139

Int. Cl. B07b *1/42;* **D06f** *29/00;* **F16j** *15/32*

U.S. Cl. 277—83 **10 Claims**



A seal construction for a fluid extractor includes an unattached noninterlocking seal nose providing a static and dynamic seal with a rotatable member and providing a static seal with a nonrotatable member. The nonrotatable member in this disclosure is in the form of a resilient member having annular undulations permitting nutational movement of the spinner relative to the fluid container. The seal nose is biased into engagement with the rotating spinner and nonrotating resilient member to maintain the dynamic and static seals.

3,582,092

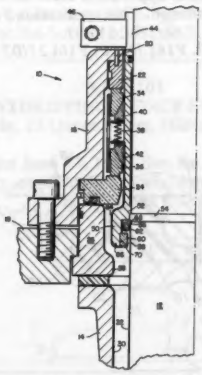
NONMETALLIC PACKAGE SEAL ASSEMBLY

Franklyn J. Amorese, Hilton, and Edward S. Harrison, Pittsford, both of, N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Aug. 4, 1969, Ser. No. 847,301

Int. Cl. F16j *15/16*

U.S. Cl. 277—87 **4 Claims**



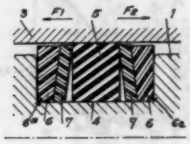
Disclosed is a package rotary seal assembly for use in corrosive atmospheres wherein the end of sleeve portion of the seal assembly exposed to the corrosive atmosphere is glass coated and is provided with a ceramic insert which forms a seat for containing the means to seal the sleeve against the rotating shaft.

3,582,093

FLUIDTIGHT SLIDING JOINT FOR A MOVING MEMBER, ADAPTED FOR USE AT HIGH WORKING TEMPERATURES AND PRESSURES

Rene Lucien, Hauts De Seine, France, assignor to Messier, Paris, France

Filed Dec. 27, 1968, Ser. No. 787,402
Claims priority, application France, Jan. 9, 1968, 135,394
Int. Cl. F16j 9/00, 15/00
U.S. Cl. 277—177 9 Claims



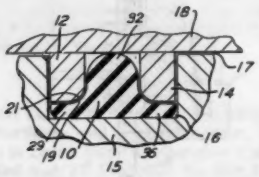
A fluidtight sliding joint for a moving member, adapted for use at high working temperatures and pressures, and comprising a sealing ring made of an elastomer, this ring having a substantially rectangular axial section and, on the side of the sealing ring opposite to the direction of application of the hydraulic pressure, or on each side of said sealing ring, depending on whether the joint is single acting or double acting, an assembly of rings is provided to prevent extrusion of the elastomer. The assembly comprises a supporting ring of hard material resistant to extrusion and an intercalated ring of a material having a hardness and an elasticity intermediate between those of the supporting ring and those of the sealing ring. The supporting ring is in contact by one substantially flat face thereof with a lateral wall of the housing of said joint, while the intercalated ring is interposed between the sealing ring and the supporting ring. The intercalated ring has two substantially flat lateral faces, parallel to each other and inclined with respect to the lateral faces of the sealing ring, and in contact by one of the lateral faces with one flat face of the supporting ring.

3,582,094

SEALING ASSEMBLY

Robert L. Whittaker, North Wales, Pa., assignor to Greene, Tweed & Co., Inc., North Wales, Pa.

Continuation-in-part of application Ser. No. 662,182, Aug. 21, 1967, now abandoned. This application Feb. 16, 1970, Ser. No. 11,497
Int. Cl. F16j 15/00; F16l 21/02
U.S. Cl. 277—188 8 Claims



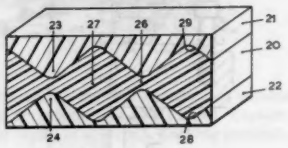
The disclosure herein describes a modified T-shaped or L-shaped ring assembly. The assembly contains an extrudable, resilient member having a T-cross-sectional shape or an L-crpss-sectional shape, where the vertical portion of the T separates and is adjacent to at least two nonextrusion rings or the upright portion of the L is adjacent at least one nonextrusion ring. The nonextrusion rings and the adjacent resilient member are mutually shaped in a complementary manner so that the corner portion of each nonextrusion ring adjacent to the corner portion of the resilient member match each other but do not form right angle corners.

3,582,095

COMPOSITE JOINT

Pierre Emmanuel Eugene Jean Bogaert, Chalet du Dyck, Wemmel, Belgium

Filed May 6, 1968, Ser. No. 726,817
Claims priority, application Luxembourg, Oct. 11, 1967, 54,653
Int. Cl. F16j 15/18
U.S. Cl. 277—233 7 Claims



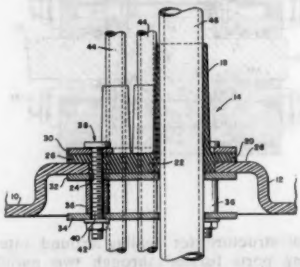
A joint to provide elasticity and moisture permeability. The joint is comprised of alternate layers of elastic open and closed-cell materials. The materials are corrugated, creating recesses in the closed-cell material which are filled with the open-cell elastic material. When the joint is compressed, the pockets of open-cell material remain permeable to moisture, while the joint retains the elasticity of the closed-cell material.

3,582,096

GASKET ASSEMBLY FOR BEVERAGE DISPENSER

Robert L. Norton, Norfolk, and William H. Jacobs, Chestnut Hill, both of, Mass., assignors to Jet Spray Cooler, Inc., Waltham, Mass.

Filed Mar. 17, 1969, Ser. No. 807,885
Int. Cl. F16j 15/10
U.S. Cl. 277—237 10 Claims



A gasket assembly for crossing a wall that describes a differential pressure barrier and having a molded rubber body with a plurality of parallel sleeves and a connecting web, with the web sandwiched between a pair of plates that clamp the web to the wall. Ducts extend through the sleeves, and the pressure about the sleeves seal them against the ducts.

3,582,097

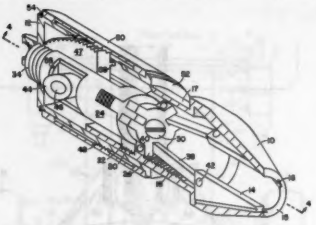
TOOL-HOLDING CHUCK

Alton D. Elliott, Jr., 2304 Anandale Road S. E., Huntsville, Ala.

Filed Oct. 1, 1969, Ser. No. 862,833
Int. Cl. B23b 31/06, 31/10
U.S. Cl. 279—61 6 Claims

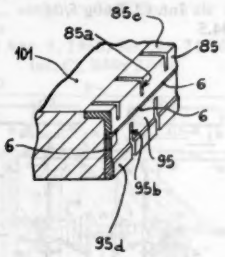
A tool-holding chuck wherein the jaws of the chuck may be finally tightened by a cam which is operated by a sector gear which has a threaded outer surface. This gear is in turn operated by a threaded collar or sleeve rotatably supported

on the chuck by a fixed supporting member between stops which prevent longitudinal movement of the sleeve and thus



enable operation of the cam when the threaded collar or sleeve is rotated.

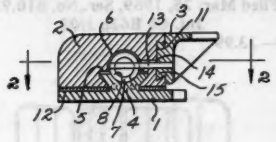
3,582,098
PROTECTIVE BANDS FOR SKIS
Jean Michal, La Mairoude, Rives, France
Filed Apr. 29, 1969, Ser. No. 820,258
Claims priority, application France, May 21, 1968, 50034
Int. Cl. A63c 5/04
U.S. Cl. 280—11.13 3 Claims



Protective bands of hard material for the upper and lower lateral edge of a ski and formed with two series of slits extending respectively from the first or the second edge of the band and terminating respectively short of the second or of the first edge thereof. These slits may be transverse to the longitudinal axis of the band or at an angle thereto. They may terminate short of the mean longitudinal axis of the band. The protective band may have a reinforced lower edge and a flanged upper edge which overlays the adjacent marginal portion of the upper side of the ski, and be formed from two extruded blanks, one with the flanged upper edge, the other one with the reinforced lower edge, by cutting these blanks to substantially half the height of the ski, by superposing them and by welding them to each other along their meeting edges.

3,582,099
TOE IRON FOR SAFETY SKI BINDINGS
Hannes Marker, Hauptstrasse 51-53, Garmisch-Partenkirchen, Germany
Filed Dec. 26, 1968, Ser. No. 787,103
Claims priority, application Germany, Jan. 5, 1968, P 16 78 275.5
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 3 Claims

A toe iron is mounted on a ski to be movable toward the tip of the ski and comprises a soleholder member, which engages the forward edge portion of the skiing boot from above. The soleholder member is held on the toe iron to be capable of a limited movement on a concave track in the form of an arc of a circle on both sides of its normal position, the radius of curvature of the track not being larger than the

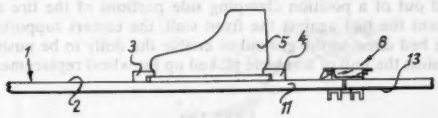


radius of the pivotal movement of the forward end of the boot.

3,582,100
SKI POLE
Ivor J. Allsop, 2194 N. Shore Road, Bellingham, Wash.
Filed Apr. 25, 1969, Ser. No. 819,340
Int. Cl. A63c 11/22
U.S. Cl. 280—11.37-B 3 Claims

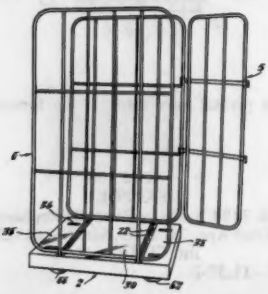
A ski pole that includes a novel and improved handle and shaft, and wherein there is provided a strap which is attached to the handle by means of a plug, there being a ski pole basket or ring at the bottom of the shaft.

3,582,101
ANTISLIPPING DEVICE FOR SKIS
Roger Ste-Marie, 21 Queen Street, Milltown, New Brunswick, Canada
Filed June 27, 1969, Ser. No. 837,037
Claims priority, application Canada, Apr. 24, 1969, 049,719
Int. Cl. A63c 7/10
U.S. Cl. 280—11.37-G 5 Claims



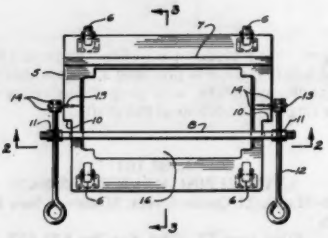
A device for preventing ski slipping when climbing a hill, which is attachable to the ski close to the ski binding for a maximum antislipping effect and in which the antislipping member is movable between an operative position across the underface of the ski and an inoperative position confined on the upper face of the ski, so as not to hinder normal downhill skiing.

3,582,102
CONTAINERS
Oliver Young Bewick, Seaburn, Sunderland, England, assignor to Towers (Sunderland) Limited, Framwellgate Moor, England
Filed Mar. 25, 1969, Ser. No. 810,936
Int. Cl. B62b 3/02
U.S. Cl. 280—33.99 7 Claims



A container has a base mounted on wheels or casters and at least two opposite sidewalls which are held in position on the base by spigots which engage holes in the base. The sidewalls can thus be lifted vertically to remove them from the base for storage purposes. A number of bases can be stacked, as each base has recesses in its top surface to receive the wheels or casters of a base placed above it. Further, each base has a number of sets of spigot-receiving holes so that several sidewalls can be stored on a single base.

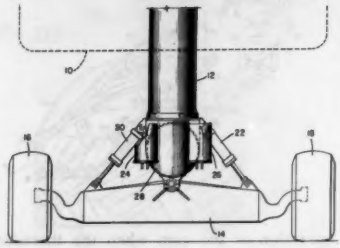
3,582,103
DOLLY FOR USE IN CHANGING VEHICLE WHEELS
Arnt L. Schoning, 18 Town Landing Road, Falmouth Foreside, Maine
Filed Sept. 11, 1969, Ser. No. 857,052
Int. Cl. B62b 5/00
U.S. Cl. 280—79.1 6 Claims



A dolly is disclosed for use in changing vehicles wheels, the dolly consisting of a bed supported by casters and having a fixed, transverse wall. A second wall is supported by the bed for movement towards and away from the fixed wall and adjustable means are provided for moving the second wall into and out of a position clamping side portions of the tire adjacent the bed against the fixed wall, the casters supporting the bed close to the ground to enable the dolly to be pushed against the hub of a vehicle jacked up for wheel replacement.

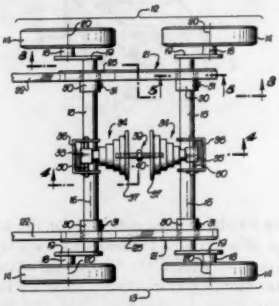
3,582,104
PIVOTAL AXLE MOUNTING FOR AN AIRCRAFT TRANSFER VEHICLE
Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to The Budd Company, Philadelphia, Pa.
Filed Sept. 2, 1969, Ser. No. 854,695
Int. Cl. B60g 1/02; B60p 3/00
U.S. Cl. 280—80 8 Claims

An improved mechanical support arrangement is provided for a vehicle having a pod for transporting passengers. The pod is supported on front and rear vertical posts mounted on the ends of a main elongated horizontal support member. The shaft member rests on the front axle of the vehicle transverse thereto with the ends of the shaft extending in opposite directions therefrom. Means are secured to the ends of the



shaft to support the support member away from the axle. A pair of diagonal strut members connect from the ends of the axle to the rearwardly extending end of the shaft. A pair of hydraulic units connect the ends of the axle diagonally upwardly to the vertical post.

3,582,105
VEHICLE SUSPENSION WITH ADJUSTABLE TANDEM AXLES
Charles W. Reynolds, 308 N. 21st St., Banning, Calif.
Filed Nov. 1, 1968, Ser. No. 772,691
Int. Cl. B60g 5/04
U.S. Cl. 280—104.5 3 Claims

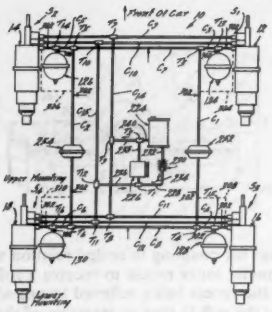


The disclosure concerns a vehicle suspension system employing rotatable tandem axles and wheels carried eccentrically by the axles, with structure interconnecting the axles for yieldably resisting axle rotation, that structure being adjustable to rotate both axles for raising or lowering the vehicle body relative to the wheels.

3,582,106
VEHICLE LEVELING SYSTEM
Johan H. Keijzer, Brustem, Belgium, assignor to Monroe Belgium N.V., St. Truiden, Belgium
Continuation-in-part of application Ser. No. 625,146, Mar. 22, 1967, now Patent No. 3,466,055. This application July 8, 1968, Ser. No. 743,244
Int. Cl. B60g 21/06
U.S. Cl. 280—124 21 Claims

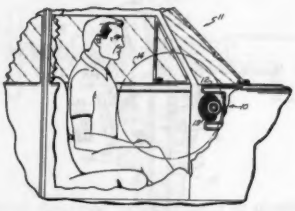
A leveling system comprising a plurality of vehicle suspension units interposed between the spring and unsprung portions of an automotive vehicle and adapted to control the relative attitude between said vehicle portions; a combination fluid-air spring unit and a fluid leveling valve device operatively associated with each of the suspension units for controlling selective actuation thereof; fluid circuit means communicating the suspension units at the front and/or rear end of the vehicle and the units along the same side of the vehi-

cle; a fluid reservoir and pumping means for transmitting actuating fluid to the suspension units; and load compensating means interposed between the suspension units on the same



side of the vehicle for controlling the actuation of the suspension units at the front and rear of the vehicle in response to unequal load distribution.

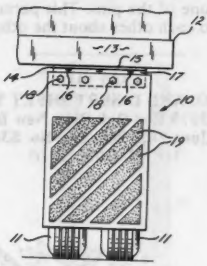
3,582,107
INFLATABLE VEHICLE CONFINEMENT
George W. Goetz, Detroit, and Robert N. Roley, Birmingham, both of, Mich., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Apr. 1, 1968, Ser. No. 717,662
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 **16 Claims**



A vehicle safety apparatus includes an inflatable confinement which is inflated by the flow of fluid from a fluid reservoir to the confinement. The confinement has a generally cylindrical shape and is constructed to receive and locate the fluid reservoir therein. The confinement is compartmentalized in certain embodiments. The compartmentalized confinement is operable to restrain movement of a plurality of vehicle passengers during a collision. The compartmentalized construction provides a restraint for each passenger and operates to control each passenger substantially independently of any other passengers during a collision. In another embodiment of the present invention, a plurality of compartmentalized confinements are utilized to control movement of the occupant of the vehicle during a collision.

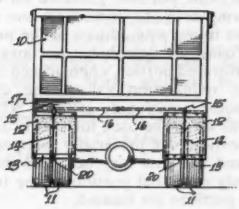
3,582,108
VEHICLE SPLASH GUARD
Ewell Lee Carlton, 11850 Edgewater Drive, Cleveland, Ohio
Filed Sept. 26, 1968, Ser. No. 762,882
Int. Cl. B62d *25/18*
U.S. Cl. 280—154.5 **4 Claims**

A louvered sheet metal core is coated with a thermoplastic resin, either totally, such as to completely fill the openings in the metal, or partially whereby small apertures are left in the splash guard. In manufacture, the core is heated and then disposed within an agitated atmosphere having finely divided particles of solid plastic entrained therein or is dipped in a



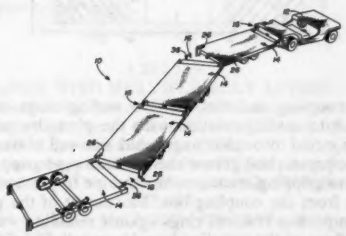
thermoplastic melt. Reflective material is applied to the soft plastic and adheres thereto.

3,582,109
MUD FLAP RETRACTION APPARATUS
Vernon Moore, 1476 Walnut Drive, Campbell, Calif.
Filed Sept. 25, 1969, Ser. No. 860,951
Int. Cl. B62d *25/16*
U.S. Cl. 280—154.5 **5 Claims**



An apparatus for the retraction of truck mounted mud flaps. The bottom portions of a pair of resilient mud flaps mounted on the rear portion of a vehicle are each affixed to guided cables. The cables affixed to each mud flap are joined and fastened to an end of a pivotally mounted lever arm. A piston disposed within a cooperating cylinder is operated by pneumatic forces and actuated by the vehicle operator, the piston being utilized to retract or extend the mud flaps. A piston rod cooperatively engages the lever arm, the mud flaps being extended or retracted upon the change of position of the piston within the cylinder.

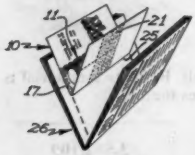
3,582,110
HITCHING SYSTEM
John F. Bryan, Jr., 3212 Mapleleaf Circle, Dallas, Tex.
Filed Apr. 23, 1969, Ser. No. 818,734
Int. Cl. B62d *53/00*
U.S. Cl. 280—408 **10 Claims**



Adjacent vehicles are connected by the engagement of a pair of jaws positioned at the front corners of one vehicle

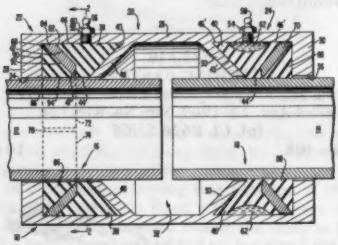
with a pair of pins positioned at the rear corners of the other vehicle. The jaws are mounted on a bar which is slidably supported for movement relative to the pins. Whenever one of the vehicles is turned, a lever slides the bar to disengage one of the jaws from one of the pins. This permits turning of the vehicles relative to each other about the other of the pins.

3,582,111
PERIODICAL AND INSERT SHEET THEREFOR
Donald H. Siiter, 5079 Red Oak Dive, New Brighton, Minn.
Filed June 26, 1969, Ser. No. 836,893
Int. Cl. G09f *23/10*
U.S. Cl. 283—56 **6 Claims**



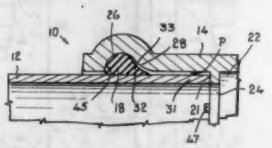
A periodical having an insert sheet of thicker material than the pages of the periodical, the insert sheet having a number of groups of detachable portions gummed on the back and the periodical having coupons printed on one of its regular pages, the coupons in any one edition of the periodical having spaces for affixing the detachable portions from one of said groups. A perforated portion when affixed to such a coupon increases its redemption value. The coupons each preferably have some notation to indicate which group of detachable portions are to be used for that issue of coupons. The detachable portions are preferably grouped together on the insert sheet and the gum may be a continuous layer of gum extending only over that portion of the insert sheet in which detachable portions are located.

3,582,112
FLUID PRESSURE-SEALED PIPE COUPLING
Francisco A. Pico, Donato Guerro 2210, Chihuahua, Chihuahua, Mexico
Filed Apr. 14, 1969, Ser. No. 815,778
Int. Cl. F16l *17/00*
U.S. Cl. 285—96 **9 Claims**



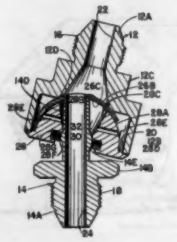
Pipe coupling includes flexible sealing rings which are pressed into sealing relation with the pipes by pressurized grease injected through fittings in the sidewall of the coupling box. The pressurized grease also actuates pipe grippers which move into gripping relation with the pipe to prevent their extraction from the coupling box. Movement of the pipe grippers compresses resilient rings against retaining walls at the end portions of the coupling box. Upon relief of grease pressure, the seals are broken and the resilient rings automatically release the grippers so the pipes can be extracted from the coupling box.

3,582,113
PIPE JOINT
Brian R. Cauthery, R.R. #1, Caledon, Ontario, Canada
Filed Feb. 27, 1969, Ser. No. 802,802
Int. Cl. F16l *17/02*
U.S. Cl. 285—110 **1 Claim**



A rigid socket for coupling in sealed relation with a plastic pipe has an annular inner recess to receive a soft O-ring, the inner flank of the recess being relieved to provide controlled deformation of the soft O-ring on insertion of the plastic pipe therethrough, and to permit the access of pressure fluid against the tapered radially outer surface of the O-ring, to provide dynamic low stress sealing of the O-ring against the plastic pipe, and thus avoid creep failure of the pipe.

3,582,114
SWIVEL CONNECTOR
Roger K. Andersen, Costa Mesa, Calif., assignor to Ex-Cell-O Corporation, Detroit, Mich.
Filed June 13, 1969, Ser. No. 833,098
Int. Cl. F16l *27/04*
U.S. Cl. 285—263 **7 Claims**

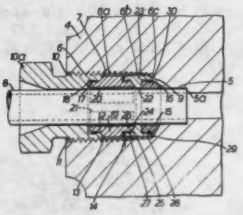


A swivel connector for conducting fluid under pressure, characterized by having two members to be angularly disposed with respect to each other in any desired plane. The connector comprises an arcuate sealing element attached to one of the members and urged into sealing engagement with the other. Such element is formed with a constant radius about a predetermined point on the member to which the arcuate element is attached. Further sealing connection is provided between the member carrying the arcuate element and a sealing member, this seal also being affected by means of a spherical surface formed about the aforementioned predetermined point.

3,582,115
MEANS FOR COUPLING A PIPE TO A COMPONENT CARRYING FLUID
John Henry Clague, Douglas, Isle of Man, British Isles, Great Britain, assignor to Mannin Engineering Limited, Isle of Man, British Isles, Great Britain
Filed Jan. 3, 1968, Ser. No. 695,475
Claims priority, application Great Britain, Aug. 26, 1967, 39370/67
Int. Cl. F16l *19/06*
U.S. Cl. 285—341 **10 Claims**

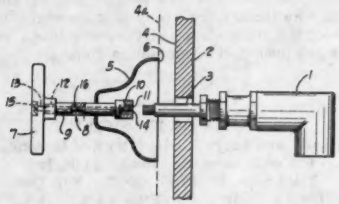
Means for coupling a pipe to a component comprises a hollow stud which is a sliding fit on the pipe, said hollow stud

being headed at one end and provided with an externally screwed shank at the other end to thread into a tapped bore in the component. Gripping and sealing means including a longitudinally split portion and a nonsplit portion are interposed between the end of the screwed shank and the seat in



the component, so that when the stud is screwed into the component end load is applied by the screwed shank to the gripping and sealing means to cause the nonsplit portion to seal against the pipe and the seat and the longitudinally split portion to grip the pipe.

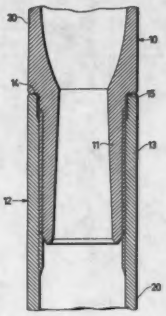
3,582,116
STEM EXTENSION FOR PLUMBING FIXTURES
Stephen A. Young, c/o Stephen A. Young Corp., Flora, Ind.
Filed Apr. 24, 1969, Ser. No. 818,901
Int. Cl. F16d *1/06*
U.S. Cl. 287—53 **1 Claim**



The invention disclosed herein relates to plumbing fittings and particularly to means for extending the length of stems thereon which might be necessitated because of the inaccuracy of mounting the valve body with which the stem is associated interiorly of the wall so that the same does not extend outwardly for enough therefrom to permit the installation and mounting of the usual escutcheon and handle on such stem. It is contemplated that the extension may be provided in any particular length desired and in various lengths where required to accommodate for the positioning of the valve body from which the main stem to be extended protrudes for the purposes set forth.

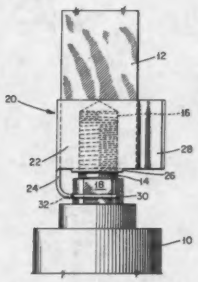
3,582,117
TUBULAR EXTENSION ROD FOR PERCUSSION DRILLING
Hans Per Olof Lundstrom, Sandviken, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sweden
Filed Mar. 24, 1969, Ser. No. 809,812
Claims priority, application Sweden, Apr. 10, 1968, 4805/68
Int. Cl. E21b *17/042*
U.S. Cl. 287—125 **1 Claim**

Tubular extension rod, for percussion drilling, having an internal thread at one end and an external thread at the opposite end thereof. The intermediate portion of the rod—which constitutes the greater part of the total rod—has a uniform wall thickness, whilst both of the threaded end portions are inwardly upset so that external mantle surface of a plurality of coupled extension rods is even and has the same



external diameter at the joints as at the intermediate portions.

3,582,118
SECURING CLAMP
Patrick J. Hogan, Mount Clemens, and Thomas R. Strang, Jr., Detroit, both of, Mich., assignors to The Budd Company, Philadelphia, Pa.
Filed Feb. 25, 1970, Ser. No. 14,136
Int. Cl. F16b *7/18*
U.S. Cl. 287—125 **4 Claims**

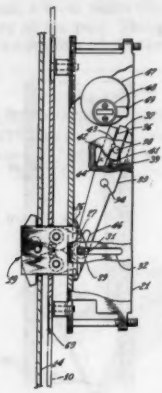


An easily removable clamp for securing both sides of a threaded connection to prevent relative rotation of one threaded part to the other.

3,582,119
LOCK WITH MULTIPLE BOLT ACTION
John A. Woodworth, Los Angeles, Calif., assignor to W. & F. Manufacturing, Inc., Glendale, Calif. and Northrop Architectural Systems, Industry, Calif.
Continuation of application Ser. No. 570,851, Aug. 8, 1966, now abandoned. This application June 12, 1969, Ser. No. 837,994
Int. Cl. E05b *65/12*; **E05c** *9/06*; **F05c** *19/10*
U.S. Cl. 292—27 **7 Claims**

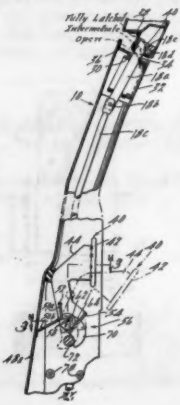
A lock assembly utilized to lock a door or the like in which the bolt mechanism thereof includes a pair of dog members functioning to provide a positive lock in the extended posi-

tion thereof. Synchronous movement of the dog members is provided and maintained by the simple expedient of a spirally



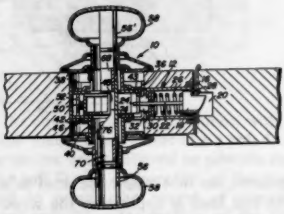
wound spring positioned in bores provided in each of the dog members.

3,582,120
CARGO DOOR LATCHING MECHANISM
William M. Doerr, Farmington; Gene O. Cowie, Madison Heights, and Claude E. Vance, Hazel Park, all of, Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed June 30, 1969, Ser. No. 837,522
Int. Cl. E05c *1/12, 1/06, 9/16*
U.S. Cl. 292—36 **6 Claims**



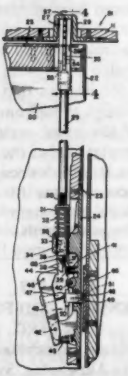
A latching mechanism for the opposed cargo doors of a motor vehicle in which one door is provided with a pair of vertical slide bolts for latching coaction with the sill and header, respectively, of the vehicle body and the other door is provided at its free vertical edge with a striker pin. When the first door is closed, the slide bolts assume a "slam" or intermediate latch position and when the other door is thereafter closed the striker pin engages a bolt-actuating lever on the slide bolt door and drives the slide bolts to their fully latched position. The first door includes a spring-biased interior handle which is normally flush with the intermediate surface; the handle has a one-way driving connection to the slide bolts so that the handle may be pivoted to withdraw the locks and open the door but will be spring returned to its flush position when released irrespective of the position of the slide bolts. The handle drives the slide bolts through the lock actuating lever and the latter is blocked by the striker pin with the bolts in fully latched position so that the slide bolts cannot be withdrawn until the other door is opened.

3,582,121
CONTROL FOR DOOR LOCK SET
Henry W. Rollins, P.O. Box 578, Waterville, Maine
Continuation-in-part of application Ser. No. 606,796, Jan. 3, 1967, now Patent No. 3,490,803. This application Sept. 26, 1969, Ser. No. 861,437
Int. Cl. E05c *1/12;* **E05b** *3/02*
U.S. Cl. 292—170 **16 Claims**



Means and method for modifying the operation of a modern cylinder lock so as to provide for an operation of the latchbolt through a push-pull action in addition to an operation of the latch bolt through the more normal rotational manipulation of the lock set handles or knobs. A lock set is modified by severing the operating ends of the opposed spindles and mounting an adapter therebetween so as to join the spindles. The adapter, between the spindles, includes an inwardly offset area defining laterally spaced camming edges, and an inclined flat camming surface extending from one end of the inwardly offset area. The configuration of the adapter cooperates with the latchbolt-retracting apparatus to effect a retraction of the latchbolt in response to either a rotation of the knobs or a push-pull manipulation thereof.

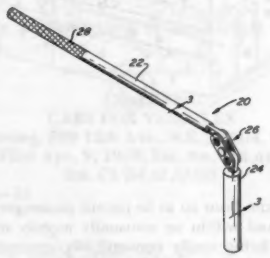
3,582,122
AUTOMATIC FLUSH BOLT
John R. Foster, and Larry R. Hunt, both of Indianapolis, Ind., assignors to Von Duprin Inc., Indianapolis, Ind.
Filed Sept. 10, 1969, Ser. No. 856,788
Int. Cl. E05b *13/20;* **E05c** *15/02;, 19/02*
U.S. Cl. 292—335 **10 Claims**



Automatic flush bolt latch means for one of a mating pair of doors, so constructed and arranged that, when both doors are closed, said one door is affirmatively locked, that when the other door is even slightly opened said one door will remain latched but with its latch means readily retractable by the application of gentle opening force to said one door, and that said latch means, when once retracted, will remain so until both doors again assume closed positions, no matter

which door closes first, whereupon said one door will again be affirmatively locked for so long as said other door remains closed.

3,582,123
MAGNETIC RETRIEVING TOOL
Smith Kyser, Lapeer, Mich., assignor to Aircraft Specialties, Inc., Lapeer, Mich.
Filed May 2, 1969, Ser. No. 821,197
Int. Cl. F16c 11/04
U.S. Cl. 294—19 2 Claims

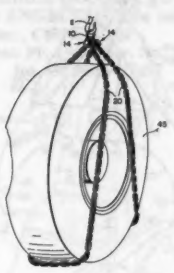


A magnetic retrieving tool which comprises an elongated handle, an elongated magnetic member and a hinge means. The hinge means secures the magnetic member to the handle and has means to maintain the magnetic member at a fixed angle with respect to the handle. The hinge means enables the magnetic member to be moved with respect to the handle without any adjustments made to the hinge means.

3,582,124
PORTABLE HANDLE, ESPECIALLY FOR USE IN PUBLIC TRANSPORTATION VEHICLE
Thomas J. Quirk, Jr., 18 & 19 Appleton St., Boston, Mass.
Filed Sept. 30, 1968, Ser. No. 763,849
Int. Cl. B65g 7/12
U.S. Cl. 294—26 1 Claim

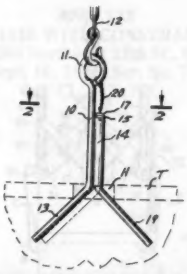
A portable handle has a hook at one end for attachment over a public transportation vehicle rail that is grasped diametrically opposite the bight in the hook by an element at the end of a shaft screwably supported in the hook element so that rotation of the handle allows the assembly to be tightened against or unloosened from the rail and provide the user with a convenient handle to grasp while standing in a public transportation vehicle.

3,582,125
TIRE SLING FOR HEAVY EQUIPMENT TIRES
John J. Collins, 1218 Quest Drive, Apt. 2, Louisville, Ky.
Filed Aug. 19, 1969, Ser. No. 851,173
Int. Cl. B66c 1/12
U.S. Cl. 294—74 8 Claims



Apparatus including a pair of chain-type pulleys each having a sling rotatably mounted on a chain sheave which can be freely rotated or locked in nonrotating position selectively.

3,582,126
CONCRETE PIPE-LIFTING DEVICE
Terry R. Bladholm, Marshall, Minn., assignor to Bladholm Bros., Culvert Company, Osseo, Minn.
Filed Sept. 2, 1969, Ser. No. 854,556
Int. Cl. B66c 1/42
U.S. Cl. 294—97 4 Claims

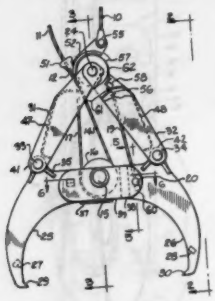


A pipe-lifting device including a pair of upright rods, each with an oblique lower portion to slip through the lifting hole of a concrete pipe, one of the rods being swingably mounted on the other to swing the oblique lower end to the opposite side of the lifting hole for underlying the wall and cooperating and lifting the pipe.

3,582,127
SWIVEL-HEAD GRAPPLE
Norman Allen Johnson, 5325 10th Ave., Delta 742 British Columbia, Canada
Filed July 24, 1969, Ser. No. 844,271
Int. Cl. B66c 1/00
U.S. Cl. 294—112 4 Claims

This disclosure pertains to a two-line grapple in which one line closes the grapple and a second line opens the grapple. The linkage employed comprises four bars and four pivot points and in this respect is similar to that of a clamshell bucket as opposed to a tong grapple. The closing line operatively shortens the distance between the jaw pivot and the uppermost pivot by exerting a compressive force in each of two actuating links which are themselves joined at one end by an uppermost pivot and are attached at their other ends to

points on the jaws intermediate the jaw pivot and the lower ends of the jaws. An opening line or lifting means supports the jaws through tensile forces in the actuating links and gravity causes the jaws to open. Means have been adapted



whereby a swivel-head provides adjustable guidance for the closing line as well as an opening impulse to the jaws when the weight of the grapple is shifted from a closing line to an opening line or lifting means attached to the swivel-head.

3,582,128

LIFTING TONGS FOR HANDLING HEAVY PRODUCTS

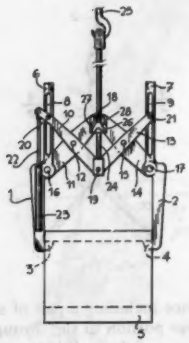
Ghislain Antoine Jean-Marie Martelee, Liege, Belgium, assignor to Cockerill-Ougree-Providence et Esperance-Longdoz en abrege "Cockerill", Seraing-lez-Liege, Belgium

Filed Apr. 29, 1968, Ser. No. 724,816

Claims priority, application Belgium, May 31, 1967, 41,380

Int. Cl. B66c *1/28, 1/66*

U.S. Cl. 294—115 **5 Claims**



Lifting tongs for handling heavy rigid loads such as coils of sheet metal comprise two gripping arms each provided with a lug for supporting said load and a suspension member with two pivots on which are articulated two pairs of arms crossed in scissors fashion articulated to said gripping arms so that the tongs may be pivoted in relation to said suspension member, by an angle of at least a few degrees, between certain limits determined by stops.

3,582,129

COLLAPSIBLE CAMPER

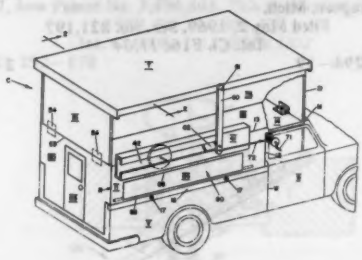
Lester L. Frank, 6201 Sprague, Omaha, Nebr.

Filed Apr. 16, 1969, Ser. No. 816,650

Int. Cl. B60p *3/34*

U.S. Cl. 296—23 **13 Claims**

This invention relates to a downwardly collapsible camper of shelter of the rigid-shell-type construction mounted in combination with an open-top boxlike rollably transportable floored frame such as the rearward cargo box of a pickup truck motor vehicle. In particular, this invention provides a camper in which, in its downwardly collapsed form, the camper roof is disposed approximately 4 feet dimensionally



above the frame floor so as to permit passengers to be transported overland within an unusually mobily stable camper, said camper being easily conveniently erected into its full lofty height, with the use of exceedingly simple, inexpensive, and reliable, auxiliary features of the camper structure.

3,582,130

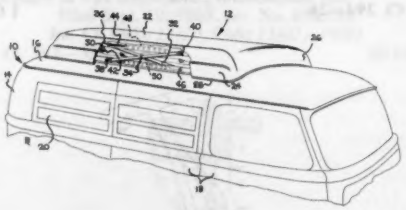
VEHICLE WITH RETRACTABLE AND EXTENSIBLE ROOF ASSEMBLY

Charles L. Borskey, P. O. Box 26, Andrews, Ind.

Filed Apr. 11, 1969, Ser. No. 815,421

Int. Cl. B60p *3/38*

U.S. Cl. 296—23 **5 Claims**



A vehicle with a retractable and extensible roof assembly comprising a ceiling for the vehicle having an opening formed at one end thereof, a load-supporting horizontally slidable closure member adapted to cover the opening in the ceiling, a vertically movable roof portion over the ceiling, movable between a fully extended portion and a retractable portion having flexible sidewalls between the movable roof portion in the ceiling, and spring-biased means for aiding in the elevation of the roof to the fully extended position thereof.

3,582,131

COLLAPSIBLE TRAILER

Alan J. Brown, 20 Torbolton Drive, Apt. 8, Rexdale, Ontario, Canada

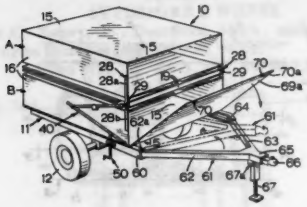
Filed Mar. 21, 1969, Ser. No. 809,229

Int. Cl. B60p *3/34*

U.S. Cl. 296—27 **11 Claims**

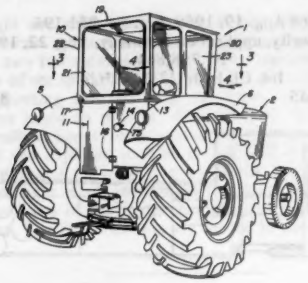
A rigid walled, collapsible trailer housing in which the

sidewalls fold inwardly to lower the roof to meet a base portion, the assembly being sectioned along a transverse vertical



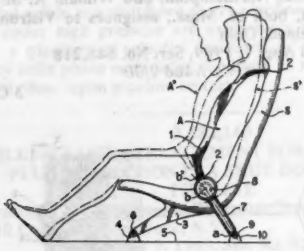
plane for the further folding of one section to overlie the other section.

3,582,132
CABS FOR VEHICLES
Leslie E. Gunning, 500 12th Ave., N.E., Minot, N. Dak.
Filed Apr. 9, 1969, Ser. No. 814,619
Int. Cl. B62d *33/06*
U.S. Cl. 296—28 **10 Claims**



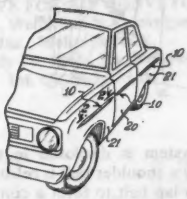
A cab construction for tractors, and the like, which is pivotable to various operative positions and includes a door at the rear of the driver's compartment.

3,582,133
ENERGY ABSORBING ARRANGEMENT FOR SEAT ON A VEHICLE
Hubert Y. DeLavenne, Meudon Bellevue, France, assignor to Automobiles Peugeot, Paris, France and Regie Nationale Des Usines Renault, Billoncourt, France
Filed July 26, 1968, Ser. No. 747,999
Claims priority, application France, July 31, 1967, Oct. 17, 1967, Apr. 18, 1968, 116,271;124,657;148,463
Int. Cl. B60r *21/02*
U.S. Cl. 296—65 **19 Claims**



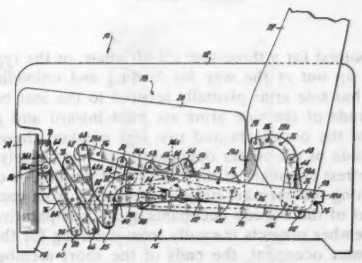
Arrangement of a seat on a vehicle adapted to allow the seat to absorb energy upon impact on the vehicle. The seat is pivoted to floor of vehicle and a deformable energy absorbing device connects the seat to the floor. This device is so adapted as to avoid restoring energy after having absorbed energy upon impact on the vehicle so that the passenger on the seat is not thrown back subsequent to absorption of the energy.

3,582,134
AUTOMOBILE IMPACT PROTECTOR
Howard Shaff, Los ANGELES, Calif., assignor to California Form Products, Inc., Culver, Calif.
Filed Dec. 11, 1968, Ser. No. 782,934
Int. Cl. B60r *27/02*
U.S. Cl. 296—146 **3 Claims**



Impact protection device comprising a strip of resilient material to which magnets are coupled for securing the strip to the door or side panel of an automobile. A stiffening wire is inserted into and along the length of the body of the strip to give rigidity to the plastic strip. For door mounting, the wire extends beyond one end of the strip, and on that end is a clamping hook for fastening the strip to the door panel.

3,582,135
RECLINING CHAIR WITH CONSTRAINED LINKAGE
Peter S. Fletcher, 200 Northwest 15th St., Delray Beach, Fla.
Filed Sept. 16, 1968, Ser. No. 762,186
Int. Cl. A47c *1/02*
U.S. Cl. 297—83 **5 Claims**



A reclining chair in which a seat, backrest and leg rest are mounted in an arm frame for movement and are guided by a mounting linkage of improved characteristics. The mounting linkage has first constraining means to completely constrain movement of the elements and, in addition thereto, second constraining means are operative during at least a portion of the movement of the elements to constrain them to move in a path slightly different from the path that they would follow under the sole influence of the first constraining means with the mounting linkage being sufficiently flexible to move under the simultaneous influence of the first and second constraining means.

3,582,136

PUSHBUTTON BUCKLE WITH LOCKING MEANS FOR STUD

William L. Pringle, Grosse Pointe, Mich., assignor to Jim Robbins Seat Belt Co., Troy, Mich.

Filed Dec. 9, 1968, Ser. No. 782,057
Int. Cl. B60r 21/00
U.S. Cl. 297—389 **11 Claims**

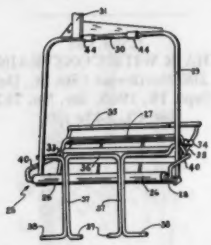
A seat belt system is disclosed in which a pushbutton buckle carried by a shoulder belt is releasably connected to a stud carried by a lap belt to form a connection between the shoulder belt and the lap belt.

3,582,137

FOOTREST FOR A THREE-SEAT SKI-LIFT CHAIR

Lee A. Reinhardt, Sackets Harbor, N.Y., assignor to Hall Ski-Lift Company, Inc., Watertown, N.Y.

Filed Dec. 12, 1969, Ser. No. 884,412
Int. Cl. A47c 7/54, 7/50
U.S. Cl. 297—417 **1 Claim**



A footrest for a three-seat ski-lift chair, of the type which swings up out of the way for loading and unloading occupants, has side arms pivotally secured to the seat back. The front ends of the side arms are bent inward and joined in front of the occupants and two legs pendant therefrom on either side of the center occupant have transversely projecting footrest members at their lower extremities. A comparatively long rest member projects outwardly from each leg for the feet of the outside occupants and a comparatively short rest member projects inwardly from each leg for the feet of the center occupant, the ends of the short members being spaced apart so that the center occupant can pass his feet between them when the footrest is lowered or raised.

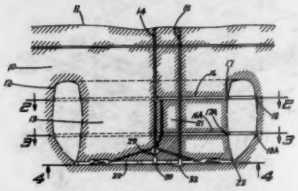
3,582,138

TOROID EXCAVATION SYSTEM

Robert L. Loofbourow, 4032 Queen Ave. South, Minneapolis, Minn.; William Vaananen, 1170 Ramsey View Court, Apt. 810, Sudbury, Ontario, Canada, and William G. Wood, 6408 Stratford Road, Chevy Chase, Md.

Filed Apr. 24, 1969, Ser. No. 818,986
Int. Cl. E21c 41/12
U.S. Cl. 299—13 **11 Claims**

A system for excavating space deep in the earth in the form of a doughnut-shaped generally cylindrical annulus or toroid having a core of substantial diameter within which there is usually at least one central shaft for access to the workings and removal of rock from the excavation. The generally circular configuration of the excavation minimizes



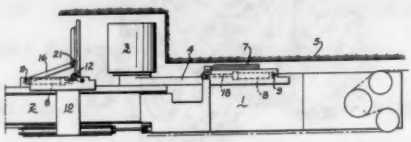
distances for access of men and equipment to the workings and removal of the rock and introduces efficiencies and cost savings resulting from minimum preparation, minimum travel distances, loading from a single station at the bottom of the shaft and is conducive to excellent working conditions.

3,582,139

MINING MACHINE WITH A ROLLER CUTTER

Paul Kaisler, Bochum, Germany, assignor to Gebr Eickhoff Maschinenfabrik und Eisengiesserei mbH., Bochum, Germany

Filed Aug. 19, 1969, Ser. No. 851,196
Claims priority, application Germany, Aug. 22, 1968, P1,758,861
Int. Cl. E21c 27/24, 35/20
U.S. Cl. 299—45 **8 Claims**



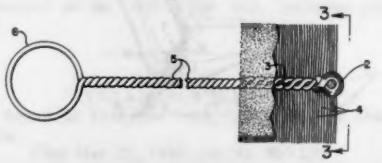
A mining machine having a frame with a roller cutter projecting laterally therefrom and with a shield member on the frame in front of and behind the roller cutter. Each shield member is swingable from a retracted position parallel to the frame to a shielding position parallel to the axis of the roller cutter. Short links pivotally connect one side edge of each shield member to the frame and longer struts are connected between each shield member and the frame and a fluid motor is connected between each shield member and the frame to swing the shield members between the two operative positions thereof. The entire assembly of each shield member and its links and struts and fluid motor may be carried by a housing which is connected to the machine frame and which opens away from the machine frame and which is closed by the respective shield member when it is retracted.

3,582,140

BRUSH

Wolfgang Kaufman, Northampton, and William A. St. Laurence, Hatfield, both of, Mass., assignors to Vistron Corporation, Cleveland, Ohio

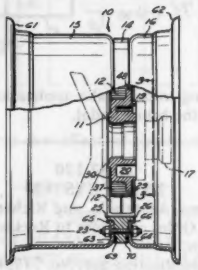
Filed Aug. 7, 1969, Ser. No. 848,218
Int. Cl. A46d 9/00
U.S. Cl. 300—21 **3 Claims**



Twisted wire-handled swabs for applying lubricant to molds and the like, which swabs are free of sharp wire ends

or obstructions, and process for their manufacture are described.

3,582,141
AUTOMOBILE WHEEL
Charles C. Kelsey, Jr., Dearborn, Mich., assignor to Motion Industries Incorporated, Detroit, Mich.
Filed Mar. 17, 1969, Ser. No. 807,849
Int. Cl. B60b 3/12
U.S. Cl. 301—64 12 Claims



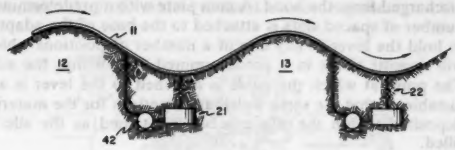
A light and strong automobile wheel particularly adapted for race cars and other high performance automobiles comprising two rim members and a spider assembly in which the portion of the spider assembly between the hub and the outer rim-supporting ring or felly comprises a sandwich panel structure made up of outer skin members or panels with an intermediate honeycomb reinforcing structure in which the axes of the cells are parallel to the axis of the wheel. The parts, including the honeycomb material, preferably are composed of light metal such as an aluminum or magnesium alloy. The parts of the spider assembly are adhesively bonded together. The rim members are bolted to the rim supporting ring.

3,582,142
GAS INJECTION ARRANGEMENT FOR RESUSPENDING SETTLED SOLIDS IN SHUT-DOWN SLURRY PIPELINE
Paul E. Titus, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Feb. 26, 1969, Ser. No. 802,614
Int. Cl. B65g 53/30
U.S. Cl. 302—14 5 Claims

Method and apparatus for facilitating the resuspension of settled solids in a shutdown slurry pipeline. Small amounts of gas under high pressure are explosively vented or injected into a pipeline at selected locations to loosen compacted slurry solid phase material to facilitate its resuspension in the liquid phase upon pipeline restart.

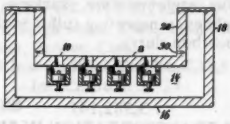
3,582,143
SLUMP TANK ARRANGEMENT FOR PREVENTING PLUG FORMATION IN A SHUT-DOWN SLURRY PIPELINE
Haralambo G. Dimopoulos, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed May 9, 1969, Ser. No. 823,415
Int. Cl. B65g 53/30
U.S. Cl. 302—14 4 Claims

Method and apparatus for preventing plug formation in a shutdown slurry pipeline. Drain pipes incorporating automatic valves are placed along low points of the pipeline and in operative association with slump tanks adapted to receive slurry material upon pipeline shutdown. Means is provided



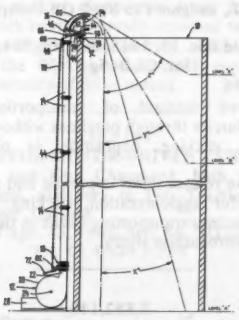
whereby slurry in the line may be recirculated back into the pipeline at another location.

3,582,144
VALVE FOR AIR CONVEYOR
Thomas L. Woolard, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.
Filed July 14, 1969, Ser. No. 841,515
Int. Cl. B65g 53/04
U.S. Cl. 301—31 3 Claims



An air current-type conveyor by which solid objects are carried on a current of air moving longitudinally over the upper side of an apertured membrane. The air is supplied to a chamber on the underside of the membrane and is permitted to traverse the apertures in the membrane only when a load being carried on the upper side thereof requires air for its lifting.

3,582,145
SILAGE DISTRIBUTOR
Gail E. Janssen, and Henry N. Wildenberg, both of Kaukauna, Wis., assignors to Badger Northland Inc., Kaukauna, Wis.
Filed Dec. 24, 1969, Ser. No. 887,842
Int. Cl. B65g 53/04
U.S. Cl. 302—60 8 Claims



A material distributor for distributing silage in a silo including a blower, a pipe to carry material from the blower, an adapter for attaching the pipe to the blower and for allowing the pipe to turn relative to the blower, a hood assembly attached to the pipe for directing material into the silo, and a lever for controlling the hood assembly. The lever is pivotally attached to the adapter. By moving the lever in a horizontal plane, the pipe is turned thereby turning the hood and changing the direction in which material is discharged from the

hood. By moving the lever in a vertical plane, the lever adjusts an outer portion of the hood, which is connected to the lever through a cable, to adjust the angle at which material is discharged from the hood. A cam plate with a predetermined number of spaced slots is attached to the base of the adapter to hold the lever in any one of a number of positions which will deposit silage in a predetermined area within the silo. The point at which the cable is attached to the lever is adjustable so that the same distribution pattern for the material deposited within the silo can be maintained as the silo is filled.

3,582,146

SULFUR TRANSPORTATION IN PIPELINES

Lewis Philip Reiss, and Frank L. Meyer, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 18, 1968, Ser. No. 784,924
Int. Cl. B65g *53/30*
U.S. Cl. 302—66 **6 Claims**

An improved method of transporting sulfur-liquid hydrocarbon slurries through pipelines without causing sulfur agglomeration, sticking, deposition or plugging of the pipelines.

The invention relates to an improved and novel process of preventing sulfur agglomeration, sticking, deposition and plugging of pipelines transporting sulfur in the form of a sulfur-liquid hydrocarbon slurry.

3,582,147

SULFUR TRANSPORTATION IN PIPELINES

Ronald K. June, Pleasant Hill, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Dec. 18, 1968, Ser. No. 784,925
Int. Cl. B65g *53/30*
U.S. Cl. 302—66 **5 Claims**

An improved method of transporting sulfur-liquid hydrocarbon slurries through pipelines without causing sulfur agglomeration, sticking, deposition or plugging of the pipelines.

The invention relates to an improved and novel process of preventing sulfur agglomeration, sticking, deposition and plugging of pipelines transporting sulfur in the form of a sulfur-liquid hydrocarbon slurry.

3,582,148

SULFUR PREPARATION AND TRANSPORTATION IN PIPELINES

Godfrey Q. Martin, Moraga, and James L. Ralph, Oakland, both of, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 18, 1968, Ser. No. 784,926
Int. Cl. B65g *53/30*
U.S. Cl. 302—66 **4 Claims**

An improved method of transporting sulfur-liquid hydrocarbon slurries through pipelines without causing sulfur agglomeration, sticking, deposition or plugging of the pipelines.

The invention relates to an improved and novel process of preventing sulfur agglomeration, sticking, deposition and plugging of pipelines transporting sulfur in the form of a solid sulfur-liquid hydrocarbon slurry.

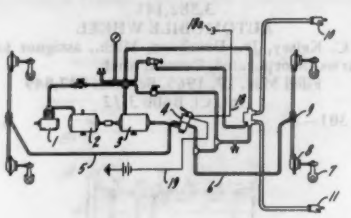
3,582,149

TRACTOR-TRAILER BRAKE SYSTEM

Arthur A. Berg, Lincolnwood, Ill., assignor to Berg Mfg. & Sales Co., Des Plaines, Ill.

Division of Ser. No. 744,880, July 15, 1968
Filed Apr. 8, 1970, Ser. No. 26,686
Int. Cl. B60t *13/68*
U.S. Cl. 303—7 **2 Claims**

A tractor-trailer brake system including an electrical signal generator controlled by the tractor brake pedal and initiating application of trailer brakes with or before tractor brake application to reduce jackknifing tendencies of tractor and trailer, the system providing trailer braking in event of failure of either tractor pressure or the signal generator, the signal



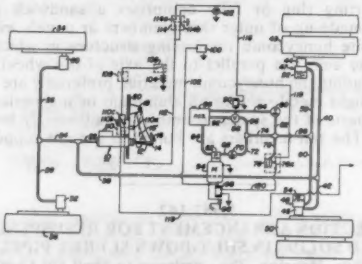
generator providing trailer brake application in proportion to the movement of the brake pedal.

3,582,150

BRAKE SYSTEM

William J. Williams, Ashtabula, and Richard L. Powers, Conneant, both of, Ohio, assignors to Rockwell-Standard Company, Pittsburgh, Pa.

Continuation of application Ser. No. 719,484, Apr. 8, 1968, now abandoned. This application Dec. 4, 1969, Ser. No. 876,154
Int. Cl. B60t *13/20, 13/04*
U.S. Cl. 303—9 **12 Claims**



A service and auxiliary brake system having a service line in which the pressure selectively is developed and relieved to actuate and relieve the brakes and an auxiliary line in which the pressure normally is maintained within a predetermined range independently of the service line pressurization to maintain auxiliary mechanically powered brake actuators inoperative and from which the pressure can be selectively or automatically relieved to permit operation of the auxiliary actuators.

3,582,151

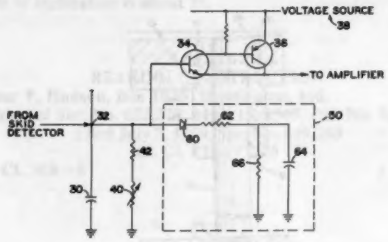
ANTISKID MODULATOR CONTROL CIRCUIT

Edgar J. Ruof, Akron, Ohio, and Ervin G. Romero, Seattle, Wash., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 22, 1968, Ser. No. 731,118
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 **4 Claims**

In large aircraft brakes, antiskid features are mandatory. Heretofore, it has been known to include a modulator system in the antiskid circuit to establish tire-runway coefficient frictions so that maximum braking pressure could be applied throughout the stop without causing a skid condition to occur. The invention incorporates a modification into a modulator circuit causing the modulator circuit to discharge more rapidly after the first antiskid cycle than it discharges throughout the remainder of the landing run so as to overcome misinformation to the circuit which occurs upon initial touchdown when the full weight of the airplane is not on the wheel. The circuit to accomplish this result incorporates a

capacitor which is adapted to charge upon the first discharge of the loading capacitor in the modulator circuit, thereby in



effect cancelling out the effect of the modulator circuit on the first skid.

3,582,152

INSTALLATION FOR CONTROLLING TWO VALVES FOR THE PREVENTION OF THE BLOCKING OF BRAKES

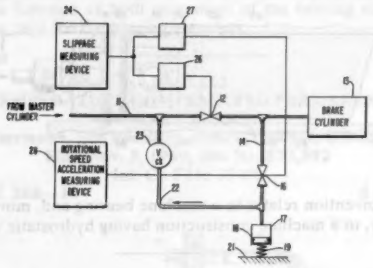
Manfred H. Burckhardt, Wailblingen, and Hans-Jorg Florus, Goppingen, both of, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Apr. 24, 1969, Ser. No. 819,044

Claims priority, application Germany, Apr. 24, 1968, P 17 55 302.5

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 **11 Claims**



An installation for preventing the blocking of brakes, in which a first valve is connected in the brake pressure medium line leading to the brake cylinder and a second valve is connected with this line between the first valve and the brake cylinder while the valves are so controlled that the first normally open valve is closed upon the occurrence of a lower slippage while the second valve, which is normally closed, is opened upon the occurrence of a higher slippage.

3,582,153

FLUID PRESSURE BRAKING SYSTEMS FOR VEHICLES

Robert Hazell Pitcher, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, Warwickshire, England

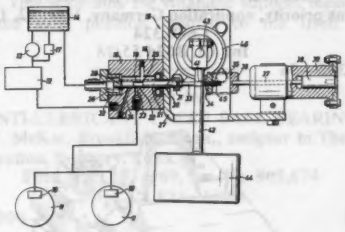
Filed Sept. 3, 1969, Ser. No. 854,898

Claims priority, application Great Britain, Sept. 6, 1968, 42415/68

Int. Cl. B60t *8/14, 13/68*

U.S. Cl. 303—24 **5 Claims**

A control device for use in a fluid-pressure braking system of a vehicle to maintain a substantially constant rate of deceleration of the vehicle when the brakes are applied, the control device including a slide valve capable of connecting brake-operating motor cylinders selectively to a source of fluid pressure or to a drain, a spring arranged to be loaded by an operator controlled device to urge the slide valve to a position to connect the said motor cylinders to the pressure source, and a deceleration responsive member caused by deceleration of the vehicle to exert a force, depending on the



rate of deceleration, opposing the spring load and therefore tending to connect the motor cylinders to the drain and so reduce the braking in accordance with the rate of deceleration.

3,582,154

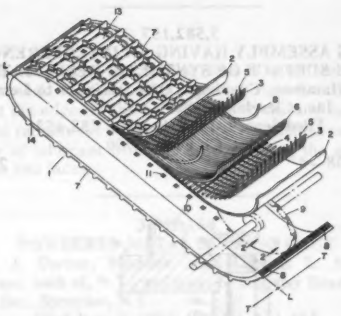
ENDLESS TRACK FOR MULTITERRAIN VEHICLES

Paul E. Russ, Sr., Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed June 3, 1968, Ser. No. 733,928

Int. Cl. B62d *55/24*

U.S. Cl. 305—35EB **17 Claims**



A lightweight endless elastomeric track for multiterrain vehicles, said track having laterally oriented textile stiffening members and having a tread pattern especially suited for mud, snow or the like, and said track capable of being propelled by a plurality of drive means.

3,582,155

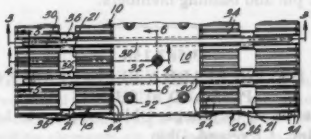
TREAD FOR MOTOR-DRIVEN VEHICLE

Gaston Marier, and Guy Chaumont, both of Princeville, Quebec, Canada, assignors to Poly-Traction Inc., Tring Junction, Quebec, Canada

Filed Apr. 15, 1968, Ser. No. 721,242

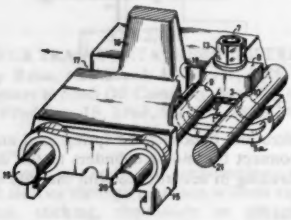
Int. Cl. B62d *55/24*

U.S. Cl. 305—38 **7 Claims**



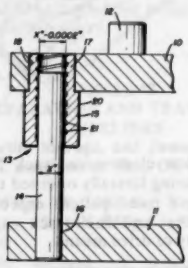
Endless tread of the type used on single track vehicles suitable for travelling on snow.

3,582,156
CONNECTOR FOR TRACK-LAYING CHAINS
Otto Korner, Remscheid, and Hagen-Heinz Wiesner, Burg/Wupper, both of, Germany, assignors to Diehl K. G., Remscheid, Germany
Filed Mar. 11, 1969, Ser. No. 806,185
Claims priority, application Germany, Mar. 12, 1968, 1,680,324
Int. Cl. B62d *55/28*
U.S. Cl. 305—56 6 Claims



A structure for interconnecting adjacent track chain links arranged in spaced relationship to and one behind the other, according to which bearing bolts respectively arranged in adjacent end portions of adjacent track chain links are received by a connector which has a first member for receiving said bearing bolts and has a second member adapted to be clamped against said bolts for clamping the latter between said first and second members.

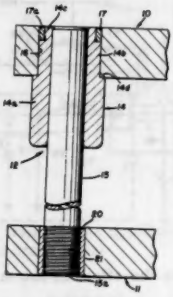
3,582,157
BEARING ASSEMBLY HAVING AN INTERFERENCE-FIT BEARING SURFACE OF SYNTHETIC RESIN MATERIAL
Edwin J. Hammon, Cuyahoga, Ohio, assignor to Lempco Industries, Inc., Cleveland, Ohio
Filed Sept. 9, 1968, Ser. No. 758,453
Int. Cl. F16c *17/00*
U.S. Cl. 308—4 2 Claims



A linearly movable bearing assembly for a die set or the like in which relatively telescoping, reciprocal, metallic guide post and bushing members are provided with an intervening layer or coating of polytetrafluoroethylene, or similar low coefficient of friction plastic material, and wherein the layer or coating is arranged normally to provide an interference fit between the pin and bushing members.

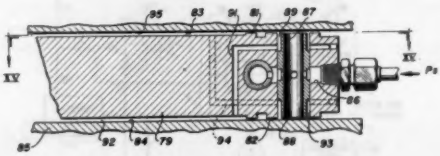
3,582,158
DIE SET HAVING READILY REPLACEABLE GUIDE PINS AND BUSHINGS
Edwin J. Hammon, Cuyahoga, Ohio, assignor to Lempco Industries, Inc., Cleveland, Ohio
Filed Nov. 21, 1968, Ser. No. 777,597
Int. Cl. F16c *1/26*, *17/00*
U.S. Cl. 308—4C 3 Claims

A die set having relatively reciprocal plates or shoes and relatively telescoping guide pins and bushings for maintaining alignment of said plates during reciprocation thereof, and



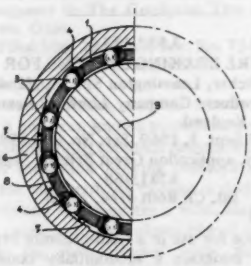
wherein said guide pins and/or bushings are connected with the plates in a manner to permit ready replacement thereof.

3,582,159
MACHINE BEARING
Herbert R. Uhtenwoldt, Worcester, Mass., assignor to The Heald Machine Company, Worcester, Mass.
Division of Ser. No. 729,690, May 16, 1968, Pat. No. 3,512,848
Filed May 11, 1970, Ser. No. 36,345
Int. Cl. F16c *17/16*
U.S. Cl. 308—5 2 Claims



This invention relates to a machine bearing and, more particularly, to a machine construction having hydrostatic ways.

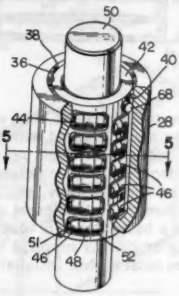
3,582,160
BALL BEARINGS FOR LONGITUDINAL AND TURNING MOVEMENTS, COMPRISING GUIDES OR CIRCUITS OF BALLS IN CLOSED CIRCUITS
Charles Henri Schutz, 51, Rue Nicolas Garner, Villeurbanne (Rhone), France
Filed June 30, 1969, Ser. No. 837,538
Claims priority, application France, June 28, 1968, 1,582,155
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 5 Claims



A ball bearing assembly for longitudinal and rotational movements has a cage with ball guides having open parts

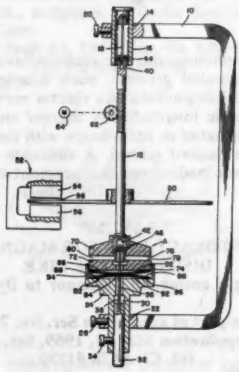
inclined with respect to the generatrices of the cage. This helicoidal inclination enables each ball as it resists the load to travel over a constantly laterally displacing line even where only a longitudinal motion is imposed on the bearing. The angle of inclination is about 3°.

3,582,161
BEARING CONSTRUCTION
Arthur F. Hudson, Box 1025, Huntington, Ind.
Division of Ser. No. 622,528, Mar. 13, 1967, Pat. No. 3,469,893
Filed July 7, 1969, Ser. No. 839,263
Int. Cl. F16c *17/26*
U.S. Cl. 308—6 **2 Claims**



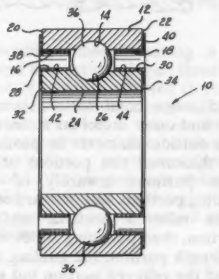
A bearing construction is provided in which the sleeve or cage receives the bearing elements and has spaced pins or stops in combination with both the cage and the surrounding bushing so that the available stroke length can be increased, being a function of both movement of the bearing elements and the cage for the bearing elements.

3,582,162
TEMPERATURE COMPENSATED PERMANENT MAGNET BEARING
Max Baermann, 506 Bensberg, Bezirk, Cologne, Germany
Filed Nov. 3, 1969, Ser. No. 873,592
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **8 Claims**



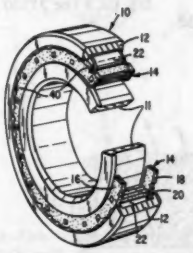
A permanent magnet bearing having a bimetallic or fluid device for compensating for changes in the strength of the magnets due to variations in temperature by physically moving one or both of the magnets relative to a fixed reference. The magnetic bearing is intended for use with apparatus of the type having a fixed support member and a support member rotatable about an axis with respect to the fixed support member. One or both of the magnets have a temperature-responsive member disposed between the magnet and its associated supporting member and so constructed as to move the magnets toward or away from their supporting member in amounts proportional to the tendency for the spacing between the magnets to increase or decrease due to variations in their magnetic strength caused by temperature changes. This maintains the rotatable support member in a preselected axial position relative to the fixed support member.

3,582,163
ANTI-LUBRICANT CREEP BALL BEARING
Lewis W. McKee, Brookfield, Conn., assignor to The Barden Corporation, Donbury, Conn.
Filed Mar. 10, 1969, Ser. No. 805,674
Int. Cl. F16c *33/66*
U.S. Cl. 308—187 **3 Claims**



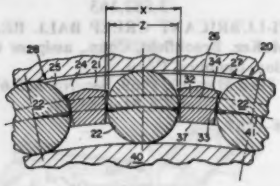
A ball bearing in which thin films of tetrafluoroethylene extend around the lands of the bearing rings from a location adjacent the edges of the ball grooves to the end faces of the rings and radially for a distance along the end faces to inhibit the flow of lubricant from the grooves along the surfaces of the lands and faces.

3,582,164
POWDERED METAL BEARING CAGE
William J. Derner, Manilus, and Thomas L. Morrissey, Syracuse, both of, N.Y., assignors to Rollway Bearing Company, Inc., Syracuse, N.Y.
Filed June 9, 1969, Ser. No. 831,483
Int. Cl. F16c *33/38, 33/44*
U.S. Cl. 308—201 **2 Claims**



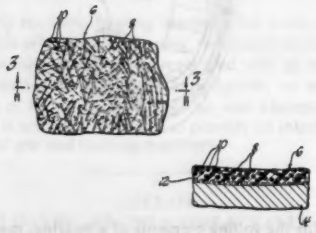
A cage for the rolling elements of a bearing, made entirely of powdered metal or made of powdered metal segments and stamped or cast steel end rings, with segments having contact with the rolling elements on the radius of the cage intersecting the centerline of each rolling element, and each end ring having oil grooves on its surface facing the race flange and oil pads in the end rings at points contacting the rolling elements.

3,582,165
CAGE-AND-ROLLER COMBINATION
Hans W. Koch, Levittown, Pa., assignor to Roller Bearing Company of America, West Trenton, N.J.
Filed Nov. 24, 1969, Ser. No. 879,352
Int. Cl. F16c 33/46
U.S. Cl. 308—217 10 Claims



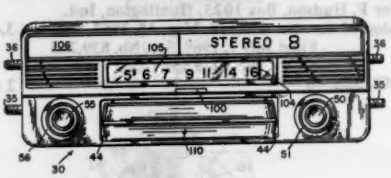
In cage and roller combinations suitable for operation between inner and outer members to form a bearing, a cage guided on its outside diameter is produced by forming a blank having thickened rim portions at the ends, relieved relatively thin portions inwardly of the rim portions, thickened guiding portions and outward retaining portions inwardly of the relieved portions and a relatively thin midlength portion, then punching windows with parallel sides from the midlength portion, the guiding and outward retaining portion and the relieved portion but not entering the rim portions, the windows being relatively wide at the ends and relatively narrow at the middle, and then coining the crossbars desirably simultaneously to form lips at the guiding and outward retaining portions near the outside while retaining parallel sides at the guiding portions near the pitch diameter, and to displace metal from the midlength portions so as to form inwardly converging sidewalls which will clear the rollers and prevent escape of the rollers inwardly. The invention may provide cage-and-roller combinations in which a single roller in a window is guided adjoining the pitch circle near the end, the guiding portion outwardly converges to retain the roller against outward motion, and the window at the end terminates short of the rims.

3,582,166
BEARING HAVING LOW-FRICTION FIBROUS SURFACE AND METHOD FOR MAKING SAME
Paul J. Reising, Birmingham, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed June 6, 1969, Ser. No. 831,031
Int. Cl. F16c 27/00
U.S. Cl. 308—238 10 Claims



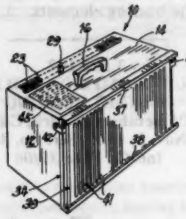
This invention comprehends a bearing having a low friction surface formed of fibers of a low-friction resin, preferably polytetrafluorethylene, in a hard resin matrix, the longitudinal axes of substantially all of the fibers extending substantially parallel to the surface of the bearing.

3,582,167
HOUSING FOR RADIO/TAPE CARTRIDGE PLAYERS
William P. Lear, Verdi, Nev., and Samuel H. Auld, Newport Beach, Calif., assignors to Lear Jet Industries, Inc., Wichita, Kans.
Division of Ser. No. 540,289, Apr. 5, 1966, Pat. No. 3,478,973.
Filed June 19, 1969, Ser. No. 834,827
Int. Cl. A47b 81/06; H05k 5/00
U.S. Cl. 312—7 8 Claims



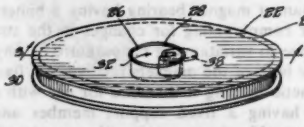
Magnetic tape cartridge players, with or without contained radio reception, are manufactured with basic common housings. Inexpensive decorative bezels are arranged for ready securement to the front end of the housings. These appear to be normally part of the assembly, and harmonize with the housing. Design changes, as different models, are thereby readily feasible for a basic player in mass production. Also, a universal mounting bracket is supplied with the basic player that accommodates most mobile installations.

3,582,168
PHONOGRAPH RECORD CABINET
Donald J. Bian, 697 Parkside, Elmhurst, Ill., and Allan J. Mager, 7 La Porte Road, Frankfort, Ill.
Filed June 13, 1969, Ser. No. 832,935
Int. Cl. A47b 81/06
U.S. Cl. 312—19 6 Claims



A cabinet for phonograph disc records having an index and a plurality of parallel grooves, each adapted to receive a record in vertical disposition. An ejector member within the cabinet is slideable longitudinally thereof and is adapted to be selectively actuated in accordance with the index designations to eject a desired record. A slideable panel affords a closure to prevent inadvertent displacement of the records.

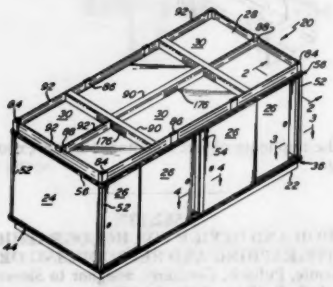
3,582,169
LOCKABLE STORAGE UNIT FOR MAGNETIC TAPES, DISCS AND THE LIKE
John B. Koenig, Lansing, Ill., assignor to Dynanamics, Inc., Lansing, Ill.
Continuation-in-part of application Ser. No. 702,449, Feb. 1968. This application May 21, 1969, Ser. No. 826,502
Int. Cl. A47b 81/00
U.S. Cl. 312—20 20 Claims



Locking apparatus for information storage units such as magnetic tape reels having a central opening therein. One

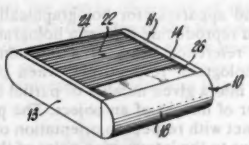
embodiment of the device, for a tape reel, includes a portion for traversing said opening and a lock unit extending into the central opening of the reel to prevent the mounting thereof on a recording machine. Another embodiment is similar to the first except that it includes a casing which also prevents access to the tape itself.

3,582,170
DISPLAY TABLE
Henry Schaeffer, Jenkintown, and Jacob Deitch, Rydal, both of, Pa., assignors to Binning Systems, Inc., Jenkintown, Pa.
Filed July 25, 1969, Ser. No. 844,774
Int. Cl. A47b *96/18*
U.S. Cl. 312—140.4 **21 Claims**



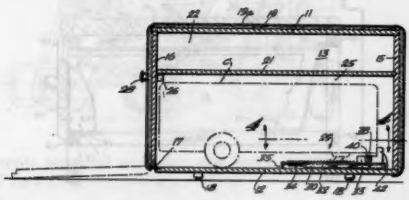
A display table having compartmented sections on its top surface. Partitions, which are preferably transparent, are used to form the sections on the top of the table. A novel bracket is provided for securing the partitions in place. The bracket is formed of plastic and includes a pair of spaced legs in which the partition will be held. The base of the bracket includes a nib having a camming surface. The base is inserted in the track with the nib being received in a groove within the track, thereby resiliently holding the bracket is place.

3,582,171
COMPACT CONTAINER FOR COSMETICS OR THE LIKE
James Michael McArdle, and William James Landen, both of Cheshire, Conn., assignors to Eyelet Specialty Company, Wallingford, Conn.
Filed Sept. 12, 1969, Ser. No. 857,484
Int. Cl. A47b *67/00*
U.S. Cl. 312—224 **17 Claims**



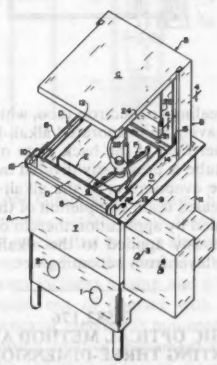
The invention contemplates a container construction involving a slide or drawer part that is longitudinally reciprocable with respect to a frame part, for opening and closing action. The slide or drawer is formed with or connected to a flexible tail or closure panel which tracks guides in the frame part during the opening and closing movements. In closed position, the flexible panel covers the top of the frame, thus sealing off a mirror or other means carried by the top of the frame. In open position, both the drawer contents and the mirror are exposed. No part of the mirror is relied upon to close or seal off the cosmetic substance, and the flexible panel which seals off the mirror is totally independent of the means which seals off the cosmetic substance.

3,582,172
COMBINATION VACUUM CLEANER STORAGE CONTAINER AND HASSOCK
Daniel H. Clark, 2550 N.E. 200th St., Miami, Fla.
Filed Dec. 29, 1969, Ser. No. 888,302
Int. Cl. A47c *3/16*
U.S. Cl. 312—311 **6 Claims**



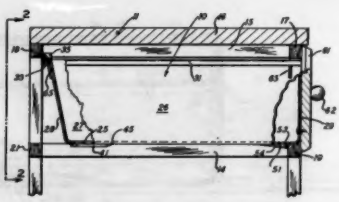
A rectangular, boxlike hassock having a swing-down hinged door at one end and provided with three interior end-to-end chambers, one of which is adapted to receive therein for storage a vacuum cleaner of the elongated tank type and the others of which are adapted to receive for storage the hose and cleaning implements of the vacuum cleaner, is described. Foot-controlled, spring-energized release mechanism is provided in the vacuum tank chamber for automatically opening the door and discharging the vacuum cleaner down a ramp provided by the opened door when the vacuum cleaner is released.

3,582,173
DRINKING-GLASS OR DISHWASHER WITH THREE-SIDED DOOR MOVABLE DOWNWARDLY INTO TANK TO OPEN WASHING AND RINSING COMPARTMENT
Tore H. Noren, and George J. Federighi, both of 1350 Donner Ave., San Francisco, Calif.
Filed Aug. 22, 1969, Ser. No. 852,371
Int. Cl. A47b *88/00*
U.S. Cl. 312—319 **6 Claims**



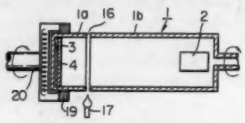
A drinking-glass or dish washer with a top hood whose upper surface lies flush with the upper surface of a work counter, the device having a glass- or dish-receiving compartment positioned below the hood and normally closed by a three-sided door. The door can be moved down into the wash water tank to gain access to the drinking glass or dish washing and rinsing compartment rather than raise the door above the hood. In one form of our device the door is counterbalanced and will remain in closed or opened position into which it has been manually moved. In a modified form of the device, an automatic door lock will hold the manually closed door in locked position until the completion of the wash and rinse cycles whereupon the lock will free the door and it will move downwardly into open position automatically.

3,582,174
MOLDED DRAWER
Martin O. Riley, Pasadena, Calif., assignor to Recreational Components, Inc., Pasadena, Calif.
Filed Oct. 10, 1969, Ser. No. 865,345
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 **7 Claims**



A molded or vacuum-formed stackable plastic drawer partially rimmed and with a perpendicular front face, the rear rim having guide members that are central of the rim and the drawer bottom having central guide members and transversely spaced lock lugs to prevent removal of the drawer from its frame inadvertently. The perpendicular front face of the drawer accepts decorative handles or panels.

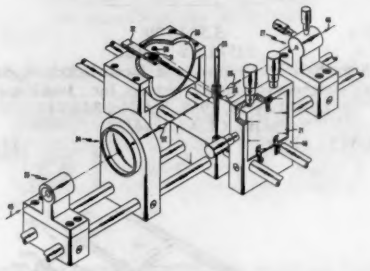
3,582,175
METHOD OF SEALING AN ELECTRON TUBE
Yoshihiro Uno, Kadoma, Japan, assignor to Matsushita Electric Industrial Company, Limited, Kadoma, Osaka, Japan
Filed June 4, 1969, Ser. No. 830,439
Claims priority, application Japan, June 7, 1968, 43-39788
Int. Cl. H01j *9/38, 17/36*
U.S. Cl. 316—3 **3 Claims**



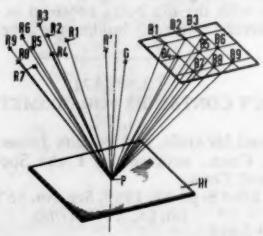
Method of sealing an electron tube, which is a storage tube for example, having an evaporated alkali-halide layer formed fast on the inner face of the back plate of the tube. The envelope of the tube is previously divided into two pieces so as to facilitate the evaporation of the alkali-halide crystals and thus must be sealed upon completion of the evaporation. The envelope is sealed by application thereto of heat with another heat simultaneously applied to the alkali-halide layer, thus prohibiting the layer from becoming wet.

3,582,176
HOLOGRAPHIC OPTICAL METHOD AND SYSTEM FOR PHOTOPRINTING THREE-DIMENSIONAL PATTERNS ON THREE-DIMENSIONAL OBJECTS
Einar S. Mathisen, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 26, 1968, Ser. No. 786,902
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **4 Claims**

Optical apparatus is disclosed for simultaneously illuminating every accessible (i.e., exposed-to-view) surface of a three-dimensional object with monochromatic spatially coherent light. The light reflected from the object is collected and directed on a photosensitive film which also receives a reference beam of monochromatic spatially coherent light of the same frequency as the illuminating beam. The photographic hologram resulting from the development of the film is illuminated by a beam which is the conjugate of said reference beam to produce a real image of the original object. A suitably photosensitized duplicate object, placed at the position of the original object is exposed to the real image whereby every corresponding accessible surface of the duplicate object simultaneously is exposed to the real image.



3,582,177
METHOD AND DEVICE FOR HOLOGRAPHICALLY PHOTOGRAPHING AND REPRODUCING OBJECTS
Horst Kiemle, Pullach, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Aug. 7, 1968, Ser. No. 750,992
Claims priority, application Germany, Aug. 10, 1967, P1,572,836.6
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **15 Claims**

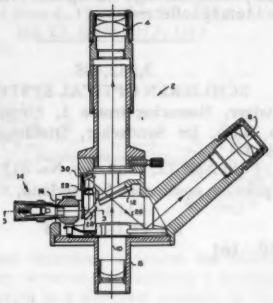


Method and apparatus for holographically photographing an object and reproducing it from a hologram includes dividing either a reference beam or a reproducing beam, illuminating a hologram, respectively, when photographing or reproducing, into a given number of partial beams producing a like number of images of an object. The partial beams are actually distinct with respect to orientation of their excitation centers relative to the intersection point of the hologram with an optical axis perpendicular to the hologram surface to an extent corresponding to the mutual spatial disposition of the individual images of the photographed object in reproducing the hologram.

3,582,178
DUAL VIEWING TEACHING MICROSCOPE WITH UNIVERSAL RETICLE PROJECTION UNIT
Olin W. Boughton, Williamsville, and Milton H. Sussman, Buffalo, both of, N.Y., assignors to American Optical Corporation, Southbridge, Mass.
Filed June 9, 1969, Ser. No. 831,547
Int. Cl. G02b *27/36, 21/18*
U.S. Cl. 350—10 **1 Claim**

A teaching microscope having a pair of eyepieces and hav-

ing a reticle pointer member, the image of which is projected into the objective light path and is movable so as to enable an operator to point out desired characteristics in the microscope image.

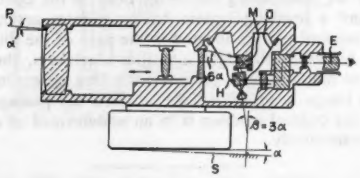


3,582,179

OPTICAL INSTRUMENT WITH STABILIZED REFLECTING COMPONENT MOUNTED AS INVERTED PENDULUM

Narihiko Nakazawa, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed June 19, 1968, Ser. No. 738,239
Claims priority, application Japan, June 23, 1967, 42/39,905
Int. Cl. G02b *23/02*; G01c *9/12*
U.S. Cl. 350—16 1 Claim



A device for magnifying the angle of slope with high stability in a leveling instrument by means of a pendulum system using elastic lines forming a triangle with the instrument body. The correcting mirror or prism is suspended by the elastic lines so that the center of gravity of the suspended mirror or prism is within the sides of the triangle formed by the lines, the elastic character of the elastic lines being utilized for tilting the pendulous mirror thereby removing the shock weakness of conventional pendulous lines.

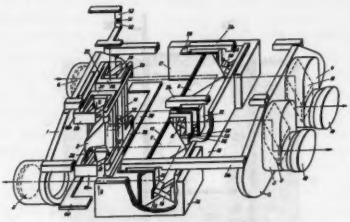
3,582,180

DEVICE FOR STABILIZING THE IMAGES OF OPTICAL INSTRUMENTS AGAINST MOVEMENT CAUSED BY VIBRATION OF THE INSTRUMENT

Daniel Gross, 40 Route des Acacias, CH1211 Geneva, Switzerland

Continuation-in-part of application Ser. No. 602,340, Dec. 16, 1966, now abandoned. This application Sept. 30, 1968, Ser. No. 777,539
Int. Cl. G02b *23/02*
U.S. Cl. 350—16 3 Claims

The device for stabilizing the images of optical instruments against movement caused by vibration of the instrument includes one or more inertia optical systems located in the optical path of the instrument and mounted on the instrument for free movement in one or more degrees of rotational and/or translational freedom. An elastic and attenuating coupling connects the inertial optical system to the instrument so that the former moves with the latter during the slow movements required to locate and retain objects within the field of view of the optical instrument.

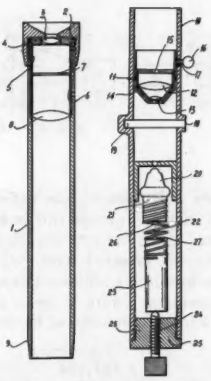


3,582,181

POCKET MICROSCOPE INCLUDING ILLUMINATING MEANS AND MOVABLE OBJECTIVE

Maria Dolores, Manau de Chveca, Rambla de Catalina, 77, 2*o*, 1*a*, Barcelona, Spain

Filed Aug. 18, 1969, Ser. No. 850,723
Claims priority, application Spain, May 21, 1969, 148,729
Int. Cl. G02b *21/06*
U.S. Cl. 350—87 5 Claims



A pocket microscope comprising a housing having first and second tubular elements coaxially press fitted together. An eyepiece is mounted on the first tubular element and an illuminating means is mounted on the second tubular element. The illuminating means includes a lamp and a battery which is normally maintained out of contact with the lamp. A manually movable actuator member is mounted on the housing end cap for causing relative movement of the battery toward the lamp. An objective means is movably mounted within the housing and is selectively movable axially thereof.

3,582,182

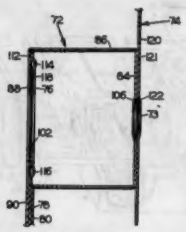
DISPOSABLE AND COLLAPSIBLE VIEWER

Robert L. Martin, 14313 N.E. Fremont, Portland, Oreg.

Filed May 14, 1969, Ser. No. 824,432
Int. Cl. G02g *27/22*
U.S. Cl. 350—140 2 Claims

A viewer is constructed of an inexpensive material such as paper and is designed to be disposed of after minimum usage. The viewer is constructed of a blank of paper foldable to form a base or handle portion, a viewing portion, and a face portion on which advertising material may be carried. The viewer has a magnifying lens and has means for movably

receiving slides viewable through the lens when the viewer is unfolded. By means of a novel arrangement of panels and



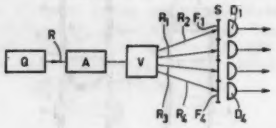
fold lines associated therewith the viewer can be folded into a flat package for shipment or storage.

3,582,183

OPTICAL MASS STORE

Uwe Schmidt, Pinneberg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1968, Ser. No. 780,745
Claims priority, application Germany, Oct. 30, 1968, P1805926.2
Int. Cl. G02f *3/00*
U.S. Cl. 350—150 **10 Claims**



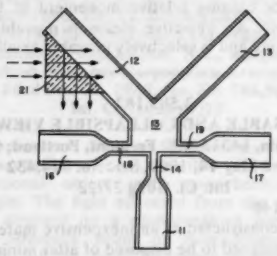
An optical mass store uses a beam deflector to position a first beam within an angular range and an image multiplier to form the deflected beam into N angularly separated additional beams scanning in synchronism with the first beam. The mutually synchronized additional beams are used to read out memory elements at a rate N times the rate of optical store employing a single unmultiplied beam.

3,582,184

HIGH-SPEED OPTICAL MODULATOR USING A FLUID OSCILLATOR

Allen F. Golden, Los Altos, Calif., and Robert R. Vokes, Hudson, N.H., assignors to the United States of America as represented by the Secretary of the Navy

Filed Oct. 13, 1969, Ser. No. 865,924
Int. Cl. G02f *1/28, 1/34*
U.S. Cl. 350—160 **2 Claims**



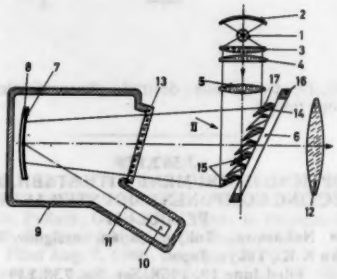
A high-speed optical modulator comprised of a fluid oscillator having first and second output channels and means for alternately switching a fluid stream into the first and second output channels. The first output channel serves as part of an optical prism, and air and liquid are alternately present in the first output channel to provide different indices of refraction so that light passing through the optical prism is alternately partially and totally reflected.

3,582,185

SCHLIEREN OPTICAL SYSTEM

Werner Steiger, Nassackerstrasse 1, Birmensdorf/ZH, and Heinrich Hogg, Im Sandacker, Otelfingen/ZH, both of, Switzerland

Filed Apr. 22, 1969, Ser. No. 818,289
Claims priority, application Switzerland, Apr. 24, 1968, 6110/68
Int. Cl. G02f *1/28*
U.S. Cl. 350—161 **7 Claims**



This invention relates to a Schlieren optical system comprising a medium for controlling the light of a separate light source for illuminating the image field on the control medium, and a masking system having mirrors arranged in a checkerboard pattern located in the path of the illuminating beam to divide the light into individual rays, the mirrors being so mounted as to provide a masking system in the path of the image beam to prevent or allow the passage of light when the control medium is in an undeformed or deformed state respectively.

3,582,186

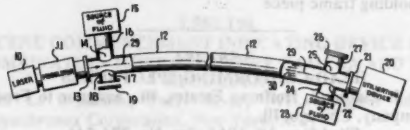
COATED RESILIENT DIAPHRAGM IN A FLUID MIRROR

George E. Platzer, Jr., Southfield, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 28, 1969, Ser. No. 811,448
Int. Cl. G02b *5/08, 7/18*
U.S. Cl. 350—279 **9 Claims**

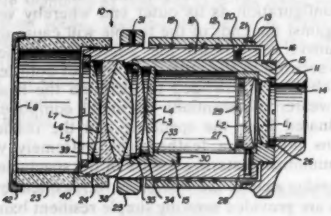
A day-night mirror containing a fluid light-controlling medium in an enclosure defined in part by a flexible elastomeric diaphragm. A flexible metal foil covers a major portion of at least one side of the diaphragm for substantially limiting the loss of fluid by permeation.

3,582,187
SYSTEM FOR THE TRANSMISSION OF ULTRAHIGH FREQUENCY ELECTROMAGNETIC WAVE ENERGY IN A FLOWING FLUID MEDIUM
David R. Skillman, 900 Quincy St. N.E., 2 Washington, D.C.
Filed June 6, 1969, Ser. No. 831,015
Int. Cl. G02b *3/12, 5/14*
U.S. Cl. 350—179 15 Claims



The application describes a system for transmitting ultrahigh frequency wave energy utilizing a conduit having a fluid flowing therein in a direction opposite to the direction of one or more beams of energy. The energy beam or beams are provided by lasers, and are confined within the conduit. The conduit may be curved to conform substantially to the curvature of the earth. The fluid may flow in either a turbulent or laminar mode.

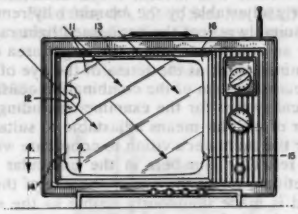
3,582,188
ZOOM MAGNIFIER
Ben W. Rau, 320 N. Deere Park, West, Highland Park, Ill., and Rokujiro Kato, 16, 3-chome, Minamiurawa, Urawa, Saitama Prefecture, Japan
Filed June 24, 1969, Ser. No. 836,061
Int. Cl. G02b *7/10, 15/14*
U.S. Cl. 350—186 9 Claims



A zoom tube type magnifier which includes, generally, eight lenses which are retained within a housing having means for adjustably positioning certain ones of said lenses with respect to one another in a fashion such as to provide a continuously variable 4.5—9 power magnifier. Three of the eight lenses of the magnifier have planosurfaces, and only one doublet is used, hence the magnifier can be easily and inexpensively manufactured. One of the lenses also is adapted to be adjustably positioned to focus the magnifier to accommodate the eye of the user and, once the magnifier is focused, it need not be readjusted when varying its magnification power between its 4.5—9 power range limit.

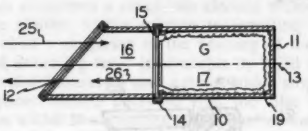
3,582,189
AMBIENT LIGHT FILTER FOR A TELEVISION RECEIVER
Scott No. Moritz, Villa Park, and Eugene J. Polley, Lambard, both of, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Aug. 19, 1968, Ser. No. 753,381
Int. Cl. G02b *27/00;* H01j *29/89*
U.S. Cl. 350—276 4 Claims

A light-masking device for improving the contrast of a television image under conditions of high ambient light comprises an optical filter having a grid of parallel alternately opaque and transparent strips of sufficient width to discriminate against nonplanar incident light. Mounting tabs selectively support the filter in a first position in front of the viewing screen such that the strips are inclined from the horizontal in one direction to discriminate against light directed from above and to the left and alternately in a second position such that the strips are inclined from the



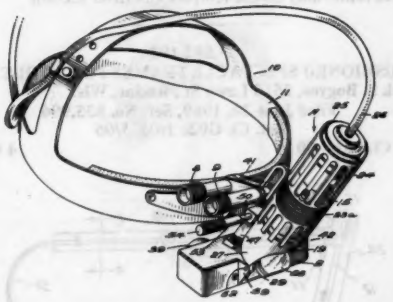
horizontal in the opposite direction to discriminate against light directed from above and to the right. The resulting structure is compact and economical to manufacture.

3,582,190
HIGH POWER MIRROR
Michael R. Smith, Thousand Oak, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Feb. 24, 1970, Ser. No. 13,400
Int. Cl. G02b *5/08*
U.S. Cl. 350—310 9 Claims



A mirror capable of reflecting high incident light density without distortion and without deteriorating as a result of residual absorption of the incident energy by providing a housing with a reflecting surface in the middle and an easily evaporable liquid to act as a heat transfer device within the housing.

3,582,191
THREE-DIMENSIONAL INDIRECT OPHTHALMOSCOPE
David N. Cohen, 376 A School St., and Brent W. Lambert, 32 Lloyd Road, both of Watertown, Mass.
Filed May 14, 1969, Ser. No. 824,603
Int. Cl. A61b *3/12;* G02b *7/18*
U.S. Cl. 351—16 6 Claims



This invention relates to the combination of two economically simplified systems adjustably supported together for coarse and fine adjustments on a headband worn by an examiner, such as a physician wherein the first system is an op-

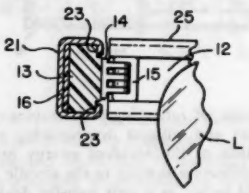
tical light concentrator system including a head-mounted housing with an adjustable light source and aligned condenser lens means longitudinally adjustable therein, said system including a light reflector exterior of the housing below said condenser lens means, which exterior reflector may be angularly adjustable by the examiner by remote control means to suitably reflect the condensed light rays of the light source to an objective spot on the target area of a subject to be examined, such as the retina of the eye of the subject, and the second system of the combination consists of an observing optical system for the examiner including binoculars with a pair of occular means adjustable to suitable optical position for the examiner's vision to cooperate with an arrangement of reflector members in the binocular housing, whereby the retinal area of the eye or the like of the subject being observed is made luminously visible to the examiner with the binoculars of the observing optical system and wherein said light reflector of the optical light concentrator system may be remotely adjustable by the examiner as the subject is observed to provide for directional positioning of the light spot while the combined systems are supported together on the examiner's head.

3,582,192

DETACHABLE DECORATIVE SLEEVES FOR SPECTACLES

Manuel M. Gitlin, 68 Oakdale Drive, Rochester, N.Y., and Chauncey F. Levy, Jr., 39 Wisner Road, Rochester, N.Y.

Division of Ser. No. 475,288, July 27, 1965, Pat. No. 3,475,083.
Filed Sept. 29, 1969, Ser. No. 861,631
Int. Cl. G02c *11/02*
U.S. Cl. 351—52 **1 Claim**



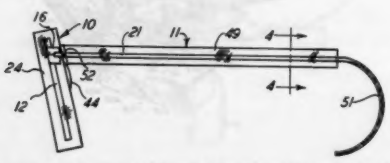
A spectacle frame has a front, lens-supporting section, and a pair of temples pivotally connected to opposite ends of the front section to swing into and out of inoperative positions in which they are folded in overlapping relation against the front section. Decorative sleeves, which are generally C-shaped in cross section, and which are made of a magnetizable material, are slidably mounted on opposite ends of the front section, and the ends of the temples pivoted thereon. Secured to the outside faces of the front section and temples beneath the removable sleeves is a layer of compressible tape containing magnetic particles which help to secure the sleeves removably on the temples and front section.

3,582,193

CUSHIONED SPECTACLE FRAMES FOR ATHLETES

Frank S. Bogyos, 2510 Lawn St., Racine, Wis.

Filed June 24, 1969, Ser. No. 835,996
Int. Cl. G02c *1/08, 5/06*
U.S. Cl. 351—90 **4 Claims**



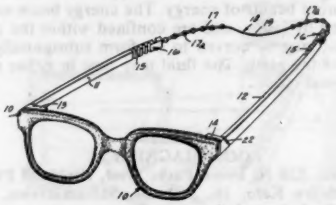
Athletic eye spectacles having a frame including a lens-holding piece and temples. The frame includes a covering of a coating material which is soft and resilient, while the frame has an inner core of a harder material for properly supporting the lenses. The coating material is sufficiently resilient or soft so that if the spectacles are hit, the wearer will not be injured, nor will the person who strikes the spectacles. The spectacles are made by placing the inner or base frame in a mold, and the coating material is poured into the mold in liquid form and is permitted to set around the base frame. Finally, the temple pieces are also coated and affixed to the lens-holding frame piece.

3,582,194

HEAD-CONFORMING SPECTACLES

Philip J. Liautaud, Hoffman Estates, Ill., assignor to Fendall Company, Chicago, Ill.

Filed Nov. 18, 1968, Ser. No. 776,546
Int. Cl. G02c *5/16*
U.S. Cl. 351—156 **4 Claims**



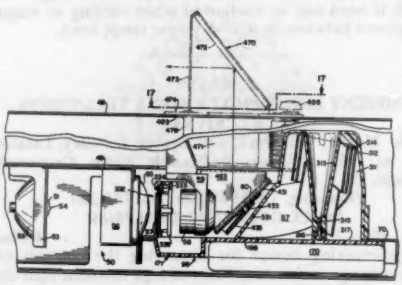
Spectacle structure is provided in which a relatively rigid temple of dielectric plastic material is secured to the spectacle frame and is provided with generally vertically grooved or notched configuration as its outer end whereby very slight pressure against the ends of the temple will cause deflection thereof transversely toward the wearer. A resilient band material is secured to the outermost ends of both temples of the spectacle and is intended to surround the head of the spectacle wearer. Substantially all metal components have been eliminated from the spectacle and the resilient head band means provides a feather-light, extremely yieldable, structure minimizing lateral pressure of the spectacle temples and nose bridge against the wearer. Novel resilient band configurations are provided assuring simple resilient band adjustment while at the same time providing extreme flexibility and yieldability of the device.

3,582,195

AUDIOVISUAL DISPLAY APPARATUS

Joseph Pignone, Essex County, N.J., assignor to Charles Beseler Company, East Orange, N.J.

Filed Dec. 26, 1968, Ser. No. 786,987
Int. Cl. G03b *31/06, 21/30*
U.S. Cl. 352—1 **13 Claims**



An audiovisual display apparatus including a collapsible rear-projection viewing screen, a projection system having an adjustable mirror for projecting images on the viewing

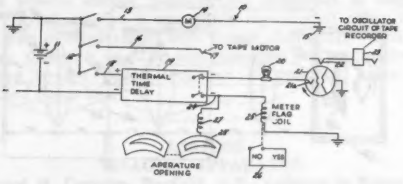
screen, and an audiovisual cartridge containing an endless loop of film and a separate audio tape. Also included are a mechanism for locking the audiovisual cartridge in position for use and for engaging the audio tape drive mechanism and sound reproduction head, and an attachment for converting the audiovisual apparatus to project images on a remote wall or screen rather than on the collapsible rear-projection viewing screen.

3,582,196

SCENE COMMENCEMENT INDICATING DEVICE FOR COMBINATION MOTION PICTURE CAMERA AND TAPE RECORDER

Jesse L. Colodner, Pearl River, N.Y., assignor to The Synchronex Corporation, New York, N.Y.

Filed Dec. 6, 1968, Ser. No. 781,824
Int. Cl. G03b *31/04*
U.S. Cl. 352—24 **4 Claims**



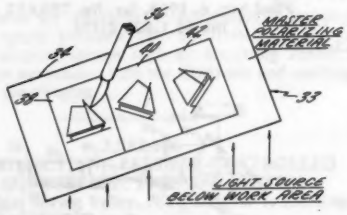
In a combination motion picture camera and simultaneously driven tape recorder, means for indicating on corresponding segments of film and tape the commencement of an individual scene. Illumination means is provided within the camera for exposing predetermined lengths of film in alternate frame fashion to result in an easily recognized pattern, and for simultaneously placing a distinctive signal on the corresponding tape segment during operation of the illuminating means.

3,582,197

PHOTOGRAPHIC ANIMATION APPARATUS AND METHOD

Robert B. Eaves, Wayne, Pa., assignor to Photo Motion Corporation, King of Prussia, Pa.

Filed Dec. 26, 1967, Ser. No. 693,633
Int. Cl. G03b *21/32*
U.S. Cl. 352—43 **29 Claims**



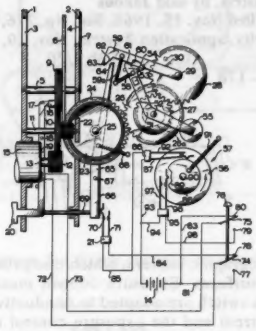
Apparatus and method for photographic animation in which a multiaxis polarizing screen is provided with multiple printed images. Illumination through a selectively changing polarizing medium recreates the images in a selected manner to create the illusion of motion. An etched tool is employed to form the multiaxis screen by frictional orientation in a particular angular relationship. A metallic pigmented coating and contact printing are employed in creating the multiple images, and direct viewing displays may be created by a rotating polarizer or by selective illumination of spatially disposed polarizers.

3,582,198

MOTION PICTURE CAMERA

Herbert Reinsch, Stuttgart, Germany, assignor to Robert Bosch Elektronik Und Photokino GMBH,, Stuttgart-Unterturkheim, Germany

Filed May 14, 1968, Ser. No. 728,996
Claims priority, application Germany, May 27, 1967, B-92754
Int. Cl. G03b *1/62*
U.S. Cl. 352—91 **10 Claims**



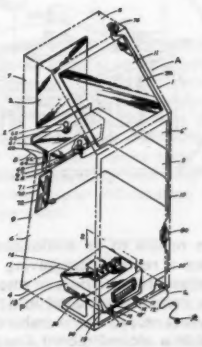
A motion picture camera wherein the film transporting mechanism comprises a reversible electric motor which also drives the shutter and a motion transmitting pin for the takeup reel of a magazine in the housing of the camera. A two-armed actuating lever is pivotable by hand to arrest the pin and to simultaneously start a timer which stops the motor with a predetermined delay so that the film transporting mechanism withdraws from the supply reel of the magazine a predetermined length of film while the motor continues to run subsequent to pivoting of the lever. Such length of film can be transported backwards by the pulldown of the film transporting mechanism while the motor is caused to rotate in reverse for an interval of time which is determined by the timer and equals the duration of the aforementioned delay.

3,582,199

FILM PROJECTION UNIT

Bert Barr, St. Clair, Ill., assignor to Essex Manufacturing Co. Inc., St. Louis, Mo.

Filed Dec. 9, 1968, Ser. No. 782,165
Int. Cl. G03b *21/10*
U.S. Cl. 352—104 **6 Claims**



A film projection unit comprising a cabinet having a viewing screen, a film projector provided within said cabinet and being located downwardly of said screen, a reflector located within said cabinet for reflecting light rays from said projec-

tor onto said screen for viewing exteriorly of the cabinet, a coin acceptor, and circuitry adapted for energizing said projector for a predetermined time increment responsive to insertion of a coin within the coin acceptor.

3,582,200

CINEMATOGRAPHIC CAMERA WITH AN ELECTRIC EXPOSURE CONTROL

Karl Vockenhuber, Vienna, and Anton Janous, Vienna-Mauer, both of, Austria, assignors to Raimund Hauser, Vienna, Austria, by said Janous

Filed Nov. 15, 1968, Ser. No. 776,161
Claims priority, application Austria, Nov. 20, 1967, A10460
Int. Cl. G03b *1/20*
U.S. Cl. 352—178 **4 Claims**

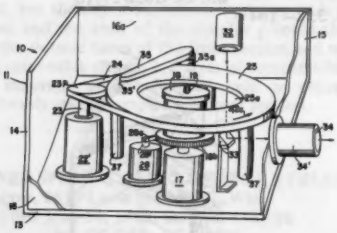
A cinematographic camera, which comprises a casing having support surfaces. Exposure control means, a source of current and a switch are adapted to conductively connect the source of current and the exposure control means for energizing the latter. A handle is provided within the support surfaces forcibly actuable when propping the camera. Film driving means and release means for the film driving means are provided, and the latter are manually controllable, which when actuated switch on the film driving means. An interlocking device cooperates with the switch and the release means on the one hand to lock the release means in their rest position when the switch is open and the exposure control means are deenergized. On the other hand, they lock the switch in its working position, as long as the release means are actuated.

3,582,201

AUDIOVISUAL RECORD MEMBER AND PLAYBACK MEANS THEREFORE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J.

Continuation of application Ser. No. 625,254, Mar. 22, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 518,685, Jan. 4, 1966, now abandoned. This application Feb. 24, 1970, Ser. No. 014,751
Int. Cl. G03b *31/06*
U.S. Cl. 353—16 **6 Claims**



This invention relates to an audiovisual record playback system employing a record disc having storage means for both audio and visual information. In one form of the invention, projectable images are stored in a tandem circular or spiral array on a first record disc member which is concentric to and rotatable on a second record disc member assembled with the first disc member and containing audio recordings in a spiral groove thereof. Accordingly, conventional tone arm means may be provided for transducing the audio recordings from the spiral groove of the second record disc member while a modified positioning and projection system is employed to selectively provide images of selected frames on the first disc member.

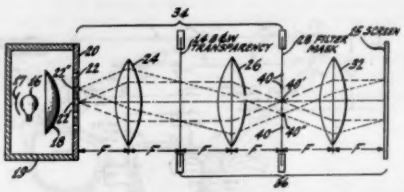
Other forms of the invention include modifications to the structure of the disc member, the video or projection scanning system and the means for driving the disc member containing visual information or image frames. The apparatus may be operative to project a series of still images in synchronization with audio descriptions thereof or a series of motion-picture images together with associated sound reproductions.

3,582,202

PROJECTION OF COLOR-CODED B AND W TRANSPARENCIES

Philip J. Donald, Woodbury, N.J., assignor to RCA Corporation

Filed Aug. 7, 1968, Ser. No. 750,884
Int. Cl. G03b *21/14, 21/00*
U.S. Cl. 353—20 **8 Claims**



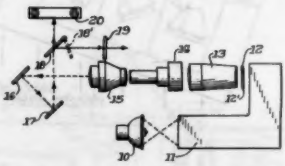
A system including a light source and lens means for projecting a color image from a black and white transparency on which the image is diffraction-grating coded in different directions for respective different colors. The lens means acts on the light passing through the transparency to image the light source in a filter plane intermediate the transparency and a utilization plane, and acts on light passing through the transparency to image the transparency in the utilization plane. The light source is constituted of a large number of small light sources arranged in an array. A color decoding filter mask located in the filter plane includes many colored filter strips, the filter strips being related, dimensioned and oriented with reference to the imaged light sources so that all of the small individual light sources contribute to the brightness of the color image in the utilization plane.

3,582,203

OPTICAL ZOOM AND IMAGE-ROTATING SYSTEM

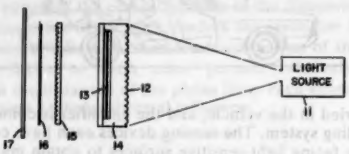
Arthur Cox, Park Ridge, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 6, 1968, Ser. No. 750,612
Int. Cl. G03b *21/28*
U.S. Cl. 353—25 **3 Claims**



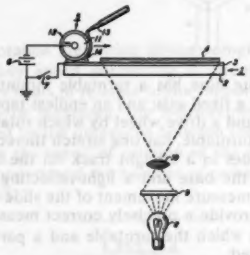
Optical systems for microfilm readers or the like having image rotation capabilities and zoom lens means for selectively varying the image magnification. The optical systems include an aperture stop positioned remote from the microfilm and substantially adjacent the projection screen for maintaining constant screen brightness through a broad range of magnification.

3,582,204
REPRODUCTION SYSTEM USING PUNCHED TAPE
Iben Browning, 745 Distel Drive, Los Altos, Calif.
Filed Feb. 8, 1968, Ser. No. 704,154
Int. Cl. G03b *21/14*
U.S. Cl. 353—38 9 Claims



An optical display method and apparatus is disclosed wherein information is selectively reproduced either simultaneously or sequentially from simple characters which form letters, numerals or more complex signs in combination according to the coded sequence of punched holes in a punched paper tape.

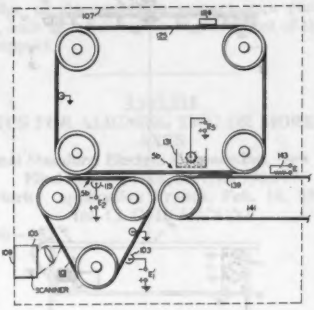
3,582,205
IMAGING APPARATUS
Leonard M. Carreira, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Division of Ser. No. 519,034, Jan. 6, 1966, Pat. No. 3,485,738.
Filed May 5, 1969, Ser. No. 821,564
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 5 Claims



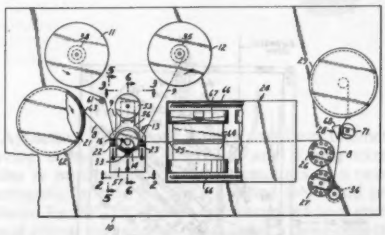
An apparatus for improving electrophoretic imaging by filling the space between the electrodes of the electrophoretic imaging system with an insulating liquid, then contacting the suspension with the electrode and applying an electric field for imaging.

3,582,206
ION PROJECTION APERTURE-CONTROLLED ELECTROSTATIC PRINTING SYSTEM
Joseph Burdige, Spring Valley, N.Y., assignor to Electroprint, Inc., Palo Alto, Calif.
Filed Mar. 1, 1968, Ser. No. 709,660
Int. Cl. G03g *15/00*
U.S. Cl. 355—16 9 Claims

Methods and apparatus for electrostatic printing including a multilayer screen having a conductive layer and an insulative layer and having apertures therein, means for deploying opposite electrostatic charges across the insulative layer, an image-projecting system for discharging the insulative layer in accordance with light received thereby, a Corotron or other like means for projecting ions through unblocked apertures in the screen and through partially blocked apertures in the screen in fewer numbers to the insulative layer of a second multilayer screen, and either a Corotron or other like means for projecting ions through the second screen to a substrate for subsequent developing and fixing, or means for projecting charged marking material through the second screen to a substrate for fixing thereon to provide positive reproductions.



3,582,207
APPARATUS FOR MAKING MULTIPLE COPIES OF AN IMAGE WEB
David G. Johnson, Maplewood, and Arthur W. Kutchera, White Bear Lake Township, Ramsey County, both of, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sept. 12, 1968, Ser. No. 759,391
Int. Cl. G03b *27/08, 27/12*
U.S. Cl. 355—90 15 Claims

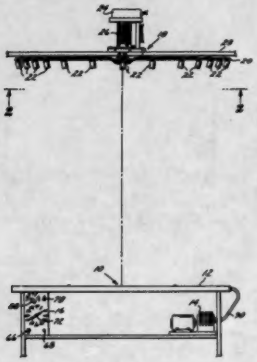


Apparatus for simultaneously making multiple copies of an original web in which the original web is guided past an elongated duplicating station in a generally helical path to simultaneously position a plurality of spaced successive portions of the original web at the duplicating station. One duplicating web is guided into intimate contact with each successive portion of the original web at the duplicating station and the original web and the duplicating webs are simultaneously moved to progressively impart information on the original web to the duplicating webs.

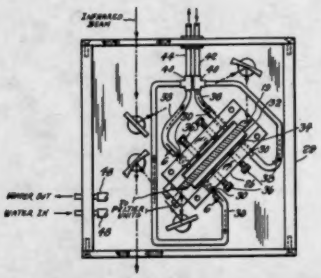
3,582,208
METHOD AND MEANS FOR PRODUCING MULTIDENSITY TINT SCREENS
Lester E. Idler, 1029 South Chantilly, Anaheim, Calif.
Filed June 1, 1967, Ser. No. 642,899
Int. Cl. G03b *27/10*
U.S. Cl. 355—132 7 Claims

The specification describes a process for making tint screens for lithography which have areas of different density using only a single master tint screen of uniform density. In the process areas of a film which is to become the tint screen are exposed to point light sources rotated circularly at one

diameter relative to the film to produce one shade density at another diameter to produce another shade density. Apparatus for practicing the invention and comprising a film holder and rotatable light source is also described.



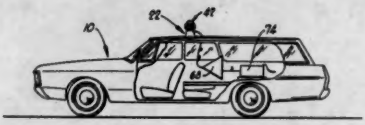
3,582,209
DETECTION OF TOXIC ORGANOPHOSPHORU AIRBORNE SUBSTANCES BY FRUSTRATED MULTIPLE INTERNAL REFLECTION SPECTROSCOPY
Charles N. La Rosa, New Hyde Park, N.Y.; Manfred J. Prager, Elizabeth, N.J., and Joseph L. Kalinsky, Valley Stream, N.Y., assignors to the United States of America as represented by the Secretary of the Navy
Filed Nov. 14, 1968, Ser. No. 775,838
Int. Cl. G01n *21/34*
U.S. Cl. 356—51 **1 Claim**



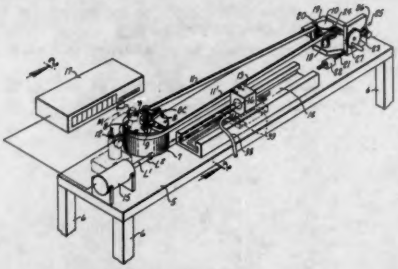
A thin germanium crystal prism in the form of an isosceles trapezoid or parallelogram whose base surface and opposite parallel surface are coated with platinum about 70 millimicrons thick, the coating having been applied in a vacuum on the order of 10 millimicrons for effective adsorptiveness. Sampled atmosphere is flowed across the base and the opposed surface of the crystal while infrared of wavelength band 9—10 microns is directed through the crystal for multiple internal reflection and the amplitude of infrared that passes through the crystal is monitored.

3,582,210
ILLUMINATION PLOTTER MOUNTED ON A MOBILE VEHICLE
Jack D. Jones, 11508 N. Victoria, Oklahoma City, Okla.
Filed Dec. 10, 1968, Ser. No. 782,640
Int. Cl. G01n *21/00;* **G01j** *1/00, 1/117*
U.S. Cl. 356—72 **10 Claims**

An illumination plotter for plotting illumination characteristics of thoroughfare lighting systems including a vehicle, an adjustable length, horizontally extending, supporting bar mounted on the top of said vehicle, and a pair of light intensity sensing devices mounted on opposite ends of the supporting bar. The sensing devices are connected to an amplifier carried in the vehicle, and the amplifier is connected to a recording system. The sensing devices each have convex, upwardly facing light-sensitive surfaces to obtain maximum exposure to light emanating from above.

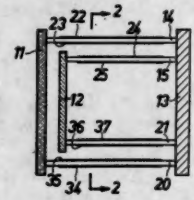


3,582,211
GONIOMETER
Douglas G. McClure, and John W. Thomas, both of Escondido, Calif., assignors to DoAll Company, Des Plaines, Ill.
Filed Oct. 2, 1969, Ser. No. 863,263
Int. Cl. G01b *9/02, 11/26, 9/10*
U.S. Cl. 356—110 **9 Claims**



A flat granite base has a turntable mounted thereon for rotation about a fixed axis; and an endless tape trained about the turntable and a drive wheel by which rotation can be imparted to the turntable, has one stretch thereof attached to a slide which rides in a straight track on the base. An interferometer on the base and a light-reflecting mirror on the slide coact to measure movement of the slide along the track and thereby provide a precisely correct measurement of the angle through which the turntable and a part fixed thereon has been rotated.

3,582,212
FABRY-PEROT RESONATORS
Gerhard Hesse, and Wolfgang Reimann, both of Jena, Germany, assignors to VEB Carl Zeiss Jena, Jena, Germany
Filed Aug. 27, 1968, Ser. No. 755,757
Int. Cl. G01b *9/02*
U.S. Cl. 356—112 **8 Claims**



A Fabry-Perot resonator comprises two plates which are displaceable relatively to each other by means of concentric series of electrostrictive rods, the number of rods being the

same in each series. The rods of the consecutive series are arranged along radii which enclose given angles. The consecutive rods are interconnected in meanderlike fashion. Two opposite surfaces of each rod bear electrically conductive linings, so that applied voltage produces an electric field between these linings. Differential influences on two radially consecutive rods produce changes in the distance apart of, or the angle between, the plates. Equality in the dimensions and thermal properties of the rods renders the resonator insensitive to thermal influence. Suitable coordination of the plate carriers relative to each other permits relatively great changes in the distances of the plates from each other and at the same time excludes thermal influence.

3,582,213

LASER ANGLE OF ROTATION MEASURING APPARATUS

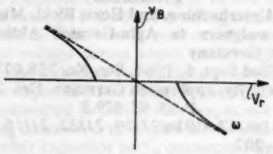
Jean-Michel Catherin, Savigny-sur-Orge, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Feb. 28, 1969, Ser. No. 803,220

Claims priority, application France, Mar. 1, 1968, 142130

Int. Cl. G01b *11/26*

U.S. Cl. 356—152 **4 Claims**



Angle of rotation measuring device comprising a platform rotating at any speed supporting a circular-shaped laser which delivers beats in relation to the support whose angle of rotation is to be measured, the measurement of said angle being obtained by the difference between the number of pulses measuring the speed of rotation of the platform in relation to the support and the number of pulses measuring the beat frequency.

3,582,214

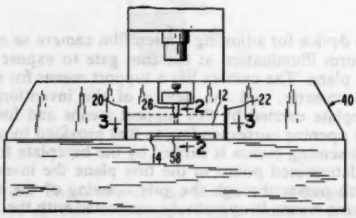
TOOL ALIGNMENT APPARATUS AND METHOD

James W. Loomis, 759 Iris, Sunnyvale, Calif.

Filed Oct. 31, 1969, Ser. No. 872,915

Int. Cl. G01b *11/27*; B43l *13/00*

U.S. Cl. 356—154 **15 Claims**



Apparatus and a method for use in aligning a cutting edge of a cutting tool wherein the tool is of the type having a pair of opposed, relatively convergent faces defining the cutting edge. The tool is aligned by directing a beam of radiation toward and against the tool faces for reflection therefrom onto respective surfaces intersecting the path of the reflected radiation. The locations of the reflected radiation on these surfaces provide an indication of the orientation of the cutting edge of the tool with respect to a predetermined reference, such as the direction of movement of the tool relative to a support.

3,582,215

APPARATUS FOR ALIGNING TWO OR MORE OPTICAL AXES

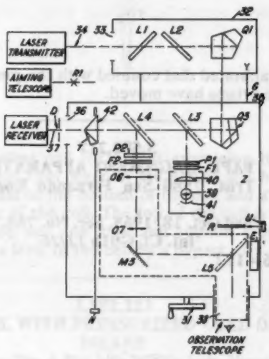
International Standard Electric Corporation, New York, N.Y.

Filed Feb. 13, 1969, Ser. No. 798,997

Claims priority, application France, Feb. 16, 1968 140,070

Int. Cl. G01b *11/26* (Y)

U.S. Cl. 356—152 **6 Claims**



Apparatus for aligning a three axis laser telemetry system having transmission, reception, and aiming axes. A laser pulse is transmitted through attenuators to a two-reflection pentagonal prism, the pulse emitted from said prism being rotated by 90°. Said pulse is transmitted to a second pentagonal prism, said second prism being a three-reflection prism, and the pulse is emitted from said three-reflection prism again rotated by 90°. The pulse emitted by said second prism is transmitted via semi-transparent mirrors and a movable trihedral light reflector to an electroluminescent screen to illuminate a spot thereon. Movable cross-wires are aligned with this spot. The reception axis is aligned with an input face of said second prism and a marking point of said reception axis is viewed through semi-transparent mirrors and moved until it is aligned with said cross-wires, thereby providing that the reception axis and the transmission axis are now parallel. A marking point of said aiming axis is then viewed and said axis is adjusted until it coincides with said cross-wires thereby providing that all three axes are aligned.

3,582,216

DEVICE FOR MEASURING THE DISTANCE BETWEEN TWO PARALLEL LINES

William R. Edwards, California, Md.; Luther Peterson, Maitland, Fla., and Thomas Kelly, San Juan, P.R., assignors to The United States of America as represented by the Secretary of the Navy

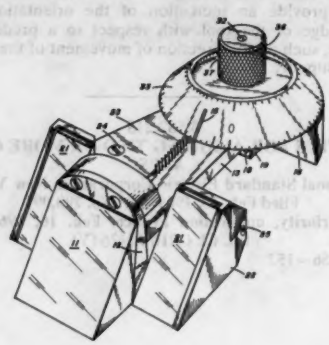
Filed Aug. 15, 1968, Ser. No. 753,041

Int. Cl. G01b *11/04*

U.S. Cl. 356—169 **10 Claims**

An optical device for measuring distances consisting of a

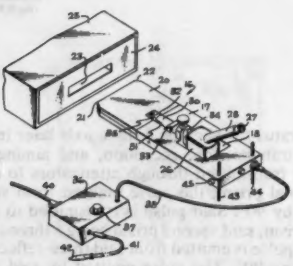
fixed prism and two movable prisms. The movable prisms are driven relative to the fixed prism by means of a rack and pinion. A calibrated dial coupled with the pinion records the distance the prisms have moved.



3,582,217
TAPE ALIGNMENT APPARATUS

Nicholas P. Trist, 7580 San Fernando Road, Sun Valley, Calif.

Filed Oct. 18, 1968, Ser. No. 768,734
Int. Cl. G01b 11/26
U.S. Cl. 356—172 6 Claims



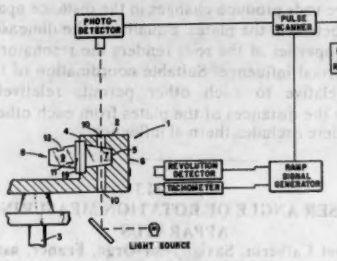
Means are disclosed herein for determining alignment between recorded data tracks carried on magnetic tape and playback heads employed to detect the data. An endless loop of a test tape is driven past the playback head so that the dimensional distance between the top edge of the tape and the top of the playback head can be measured against microscopic scale. Should the distance be other than that set for proper playback tracking, the playback head may be vertically adjusted to compensate for any misalignment.

3,582,218
MULTISTATION PHOTOMETRIC ANALYZER

Norman G. Anderson, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 17, 1969, Ser. No. 867,340
Int. Cl. G01n 21/24
U.S. Cl. 356—197 10 Claims

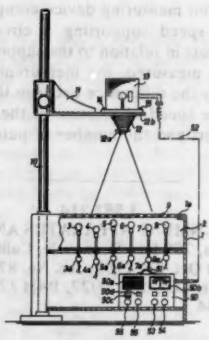
A multistation, single-channel photometric solution analyzer having a rotor adapted to carry a plurality of removable cuvettes in the form of rigid, hollow, elongated bodies exteriorly engaged by a flange seating against an axially extending surface of the rotor. The cuvettes may be affixed to a flexible belt to facilitate transport, installation, and removal of cuvettes as a group.



3,582,219
LIGHT MEASURING MEANS FOR MICROFILM CAMERAS

Josef Pfeifer, Unterhaching, and Horst Bickl, Munich, both of, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 6, 1968, Ser. No. 758,077
Claims priority, application Germany, Oct. 27, 1967, P 15 97 079.3
Int. Cl. G01n 21/06, 21/22, 21/16
U.S. Cl. 356—202 10 Claims



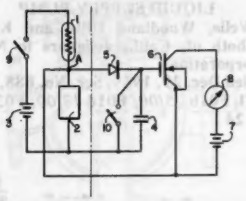
A device for adjusting a microfilm camera so as to achieve uniform illumination at the film gate to expose film in the film plane. The camera has a support means for supporting a film cassette, and the device of the invention includes a baseplate carried by this support means and formed with a gate opening corresponding to that provided by a cassette. A light-sensing means is carried by the baseplate for sensing at predetermined points in the film plane the intensity of light which passes through the gate opening of the baseplate. A moving means is operatively connected with the light-sensing means to move the latter with respect to a pair of mutually perpendicular coordinates. The light-sensing means includes at least one photocell which provides a signal corresponding to the light intensity, and distant from the light-sensing means is a light-indicating means coacting with the light-sensing means to indicate in response to the signal from the photocell the light intensity sensed by the light-sensing means.

3,582,220

LIGHT CONTRAST METER FOR MEASURING THE DIFFERENCE BETWEEN MAXIMUM LIGHT INTENSITY AND IMMEDIATELY INCIDENT LIGHT INTENSITY OR OTHER INTENSITY

Tsukumo Nobusawa, Asaka-shi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Feb. 18, 1969, Ser. No. 800,191
Claims priority, application Japan, Feb. 21, 1968, Feb. 21, 1968, 43/10503;43/10504
Int. Cl. G01j *1/10, 1/12, 1/44*
U.S. Cl. 356—226 10 Claims



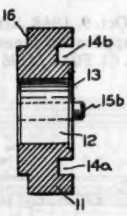
A light contrast meter successively exposable to different light intensities provides a visual indication of the light intensity extremes or the difference between the light intensity extreme and the immediate incident light. In one form a capacitor is charged through a diode to a voltage corresponding to maximum incident light and is connected in series with an impedance the voltage across which varies with the incident light and a meter measures the difference of this voltage and that across the capacitor. In another form a pair of photoconductors are connected in series with respective resistors one capacitor being connected through a diode across the first resistor and another capacitor being connected through a diode across the second photoconductor and meters measure the capacitor voltages.

3,582,221

SAMPLE HOLDER FOR INFRARED SPECTRA APPARATUS

Marvin P. Smoak; Rick A. Porter, and James A. Knight, Jr., all of Atlanta, Ga., assignors to the United States of America as represented by the Secretary of Agriculture

Filed Nov. 6, 1968, Ser. No. 773,828
Int. Cl. G02b *21/34*
U.S. Cl. 356—244 1 Claim



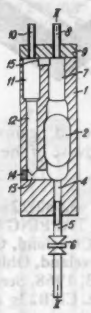
This invention relates to a sample holder useful for obtaining the infrared spectra of the short staple fibers of either a natural or synthetic fiber. The method does not require cutting, grinding, or sifting the fibers or the addition of any extraneous material. Sample preparation involves shaping a thin layer of parallel fibers under pressures comparable to those used in preparing KBr discs. The sample holder is multipurpose being operable to immobilize the fibers before, during, and after the pressing operation.

3,582,222

SAMPLING CELLS

Rene Hoblik, Drancy, France, assignor to Roussel Uclaf, Paris, France

Filed Apr. 10, 1968, Ser. No. 720,065
Claims priority, application France, Apr. 18, 1967 103,159
Int. Cl. G01n *1/10*
U.S. Cl. 356—246 8 Claims



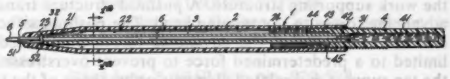
A liquid sampling cell for use in examining liquids with visible or invisible light wherein the actual cell has an inlet pipe feeding liquid to the bottom of the cell and a drain pipe from the bottom of the cell. The top of the cell is connected to a suction pipe and the inlet and suction pipe are connected above the level of the cell by a bypass.

3,582,223

LEAD PENCIL WITH PRESSURIZED LEAD DRIVING MEANS

Tsan-Chang Kuo, No. 6 Hsi Mia Li, Tu-kuh, Yung Lin Hsien, and Shan-Mu Hong, No. 259-10, Cheng I North Road San Chung, Taipei Hsien, both of, Taiwan

Filed May 28, 1968, Ser. No. 732,688
Int. Cl. B43k *21/02*
U.S. Cl. 401—73 8 Claims



A lead pencil including a pressurized lead driving means for positioning a piece of writing lead at the writing position and a means to securely hold a substantial length of the lead within the pencil to prevent vibration and breakage problems.

3,582,224

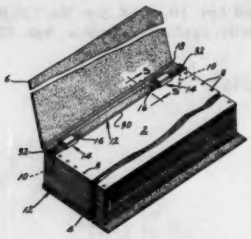
LOOSELEAF POST BINDER FASTENER ASSEMBLY

Frank Stanley Schade, Holyoke, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.

Filed Dec. 13, 1968, Ser. No. 783,545
Int. Cl. B42f *3/00, 13/06*
U.S. Cl. 402—17 1 Claim

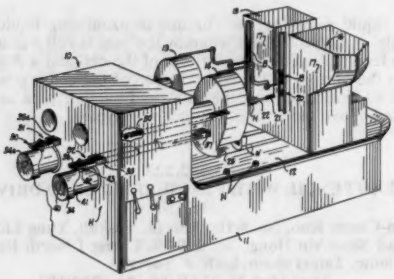
A binding strip and post clamp construction for expandable looseleaf binders utilizing posts of a stiffly flexible rodlike character, comprising a folded two-ply strip of resilient coverboard material with registrable holes and a clamp of stiff springy material slidably engaged on the strip, a lower plate of the clamp underlying the strip, a bight portion engaging the fold thereof, and a parallel upper plate having a free edge reversely hooked to receive the edge of the upper ply for guided clamp movement and to frictionally grip said

lower ply between the plates, the upper plate also having a post receiving channelled section for sliding over terminal



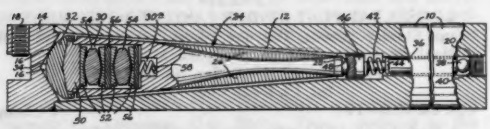
end portions of posts flexed against the strip. The clamp is slidable into position endwise of the strip.

3,582,225
THREAD TAPPING MACHINE
Florenz Joseph Hanzel, Cleveland, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio
Filed Oct. 23, 1968, Ser. No. 769,948
Int. Cl. B23g *1/00*
U.S. Cl. 408—6 **10 Claims**



A thread tapping machine includes a workpiece positioning structure, a tapping head including a tap support of a diametrical extent for reception of tapped articles, and a drive for advancing the tapping head toward and away from the work supporting structure. A pushrod structure transmits advancing forces to the tapping head. The pushrod structure is constructed so that the advancing forces transmitted are limited to a predetermined force to prevent overstressing of the tap support and related elements or breakage of the tap.

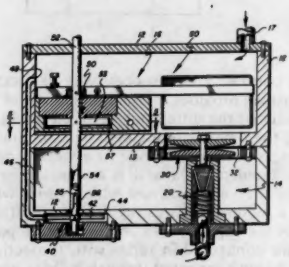
3,582,226
UNIVERSALLY DAMPED TOOL HOLDER
Norval E. Shurtliff, 908 First Place, Springfield, Oreg.
Filed Jan. 2, 1969, Ser. No. 788,419
Int. Cl. B23b *29/03*
U.S. Cl. 408—143 **15 Claims**



A tool holder damped against vibrations having a wide range of frequencies comprises a tool support member provided with tool mounting means. The support member has a recess containing a segmental vibration damping member. The latter includes a plurality of nesting pieces. The meeting faces of the pieces are in frictional contact with each other. At least come of the pieces are spaced from the recess sidewall. Resilient means bear against the pieces, maintaining them wedged together in normally centered position.

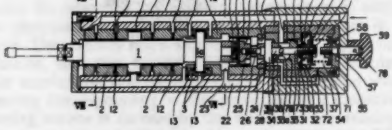
Displacement of the tool holder, such as occurs during operation of a cutting or other tool mounted thereon, results in a compensating damping movement of one or more of the pieces comprising the segmental damping member. The individual pieces are contoured and dimensioned to make individual ones more easily displaced than others, thereby compensating for vibrations occurring over a wide range of frequencies. This prevents the rhythmic chatter-causing vibration of the assembly.

3,582,227
LIQUID SUPPLY PUMP
Wallace W. Velie, Woodland Hills, and Kimble F. Tesh, Sepulveda, both of, Calif., assignors to North American Rockwell Corporation
Filed Dec. 29, 1969, Ser. No. 888,245
Int. Cl. F01b *25/00;* **F01d** *17/00;* **F03d** *7/00*
U.S. Cl. 415—24 **7 Claims**



A pump assembly to supply liquid at a low pressure to an apparatus consists of a vacuum activated fuel lift device wherein fuel from a submerged or raised fuel supply tank is caused to flow by ambient pressure into a chamber. As a centrifugal pump empties the chamber it creates a partial vacuum within the chamber which acts on a diaphragm device subsequently opening a valve which causes liquid stored at ambient pressure to enter the partially evacuated chamber. Means are provided to open the chamber to atmosphere when the pump reservoir is filled to capacity.

3,582,228
APPARATUS FOR CONTROLLING THE ROTATION OF A HIGH-SPEED ROTATING SPINDLE
Tamaki Tomita, Okazaki; Ryuji Wada, and Ituo Yokoyama, both of Kariya, Aichi Prefecture, all of, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Aichi Prefecture, Japan
Filed Oct. 9, 1968, Ser. No. 766,065
Claims priority, application Japan, Oct. 9, 1967, 42-65110
Int. Cl. F01d *15/06;* **A61c** *1/10*
U.S. Cl. 415—30 **6 Claims**

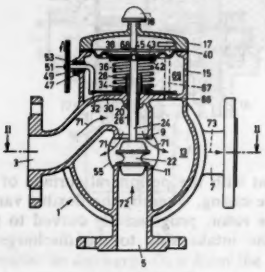


An apparatus for controlling the rotation of a high-speed rotating spindle supported by gas bearings, the spindle being maintained in a floating state by a gas film interposed between the periphery thereof and the peripheries of the bearings and rotated by a gas turbine coaxially mounted therewith, the bearings and the turbine being driven by a gas which is supplied from one common supply source, including means for preventing the spindle from whirling.

3,582,229
CIRCULATING PUMP FOR HOT WATER HEATING SYSTEM

Jost Eduard von Fellenberg, Arbon, Switzerland, assignor to Hans A. Troesch, Zurich, Switzerland

Filed Aug. 25, 1969, Ser. No. 852,832
Claims priority, application Switzerland, Sept. 3, 1968, 13,213
Int. Cl. F01b *25/00*
U.S. Cl. 415—47 9 Claims

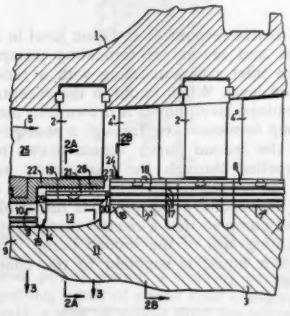


A combined circulating pump and mixing valve for a hot water heating system comprises a single housing for the pump and the mixing valve. The mixing valve body is mounted in the housing between the hot and cold water inlets and the outlet, and the pump impeller is also mounted in the housing. The pressure differential produced by the impeller between its inlet and outlet is received by a device mounted in the housing, and this device controls the mixing valve body in response to the pressure differential transmitted to the device by the pump.

3,582,230
TURBOMACHINE WITH COOLED ROTOR

David Schmidt, Zurich, and Paul Moser, Winterthur, both of, Switzerland, assignors to Brown Boveri-Sulzer Turbomachinery Limited, Zurich, Switzerland

Filed Apr. 28, 1969, Ser. No. 819,771
Claims priority, application Switzerland, Feb. 26, 1969, 2855/69
Int. Cl. F01d *25/12, 5/08*
U.S. Cl. 415—117 5 Claims

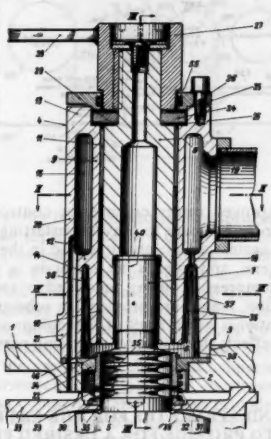


A turbomachine for an elastic fluid, having a rotor cooled by an elastic fluid which in the region of the roots of the rotor blades comprises cooling ducts, and a supply duct to supply coolant to said cooling ducts, which is formed by a section of the rotor shaft situated at the high pressure side of the blading and by a part of the housing. In the hub of the rotor on the high pressure side of the first rotor blade ring, as viewed in the direction of the pressure gradient, a number of feed ducts, corresponding to the number of said cooling ducts, is provided, said feed ducts being connected to said cooling ducts and having a cross section by a multiple greater than that of said cooling ducts, the inlet-side mouths of said feed ducts being situated in the region of the outlet-side mouth of said supply duct.

3,582,231
BEARING MOUNT FOR VANE RINGS OF TURBOENGINES

Ferdinand Zerlauth, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Nov. 27, 1968, Ser. No. 779,545
Claims priority, application Switzerland, July 26, 1968, 11276/68
Int. Cl. F01d *9/00*; F04d *25/02*
U.S. Cl. 415—135 16 Claims

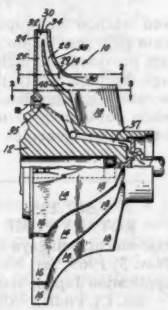


The blades of the vane ring are supported in an axle housing which is fixed to the outside of the blade carrier. Each housing includes a spaced inner wall and outer wall which define a coolant chamber therebetween. The inner wall also terminates short of the outer wall to form an open-ended chamber for reducing the flow of heat from the working medium within the blade carrier.

3,582,232
RADIAL TURBINE ROTOR

Ulo Okapuu, St. Lambert, Quebec, Canada, assignor to United Aircraft of Canada Limited, Lonqueuil, Quebec, Canada

Filed June 2, 1969, Ser. No. 829,508
Int. Cl. F01d *5/08*
U.S. Cl. 416—90 4 Claims

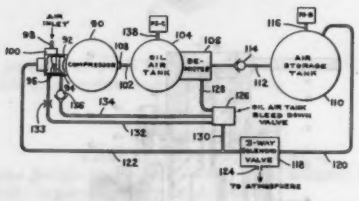


A turbine rotor having radially extending blades, each provided with an internal passage through which cooling air may

pass, with the passages opening on to the convex, low pressure surfaces of the blades of the rotor.

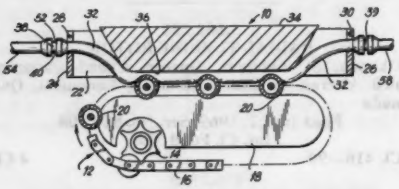
The invention herein described was made in the course of or under a contract or subcontract thereunder (or grant) with the United States Department of the Army.

3,582,233
ROTARY COMPRESSOR CONTROL SYSTEM
Carl Bloom, Springfield, Mass., assignor to Worthington Corporation, Harrison, N.J.
Filed Apr. 24, 1969, Ser. No. 819,011
Int. Cl. F04b *49/00*
U.S. Cl. 417—12 **22 Claims**



New and improved rotary compressor control means are provided and include means to prevent restarting of the compressor motor against a high-pressure load in the compressor discharge system, and means to maintain a flow of air through the compressor during unloaded operation of the latter. In addition, means are provided to substantially attenuate the operational noise level of the compressor, and the discomforting effects thereof upon operating personnel.

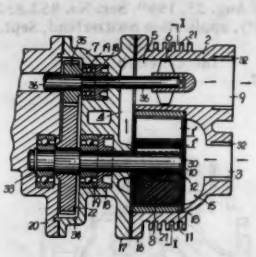
3,582,234
METHOD AND APPARATUS FOR THE CALIBRATION OF TUBING TO PROVIDE FOR A DESIRED FLOW RATE THERETHROUGH
Jack Isreeli, Mamaroneck, and Aaron Kassel, Brooklyn, both of, N.Y., assignors to Technicon Corporation, Tarrytown, N.Y.
Filed July 14, 1969, Ser. No. 841,351
Int. Cl. F04b *43/08, 43/12*
U.S. Cl. 417—53 **11 Claims**



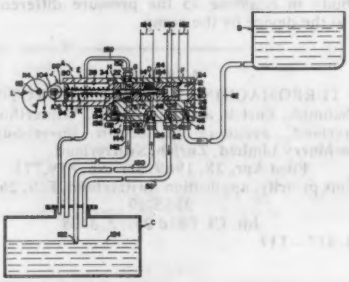
New and improved method and apparatus for the calibration of a tube to accurately provide for a predetermined flow rate therethrough are provided and include the monitoring of the flow rate through the tube and, if the latter exceeds said predetermined flow rate, the reduction of the internal diameter of said tube while continuing to monitor the flow rate therethrough until the latter coincides with the desired flow rate.

3,582,235
ROTARY PUMP
Heijiro Ito, 147, Seijo-machi, Setagaya-ku, Tokyo-to, Japan
Filed Nov. 5, 1969, Ser. No. 874,158
Claims priority, application Japan, Mar. 4, 1969, 44/16373
Int. Cl. F04b *23/08*
U.S. Cl. 417—205 **2 Claims**

This invention relates to a pump for delivering a fluid between a casing and a rotor thereof to the discharge side of the casing by rotating the rotor, more particularly relates to a rotary pump operable as a species of eccentric pump, wherein the rotor or impeller having radially extended flexible vanes, is arranged eccentrically in the impeller chamber in such a manner that the outer edges of the vanes are in sliding engagement with the peripheral surface of the impeller chamber of the casing, whereby the flexible vanes are, upon rotation of the rotor, progressively curved to pump up the liquid from the intake side to the discharge side of the machine.



3,582,236
CONTROL DEVICE RESPONSIVE TO LIQUID LEVEL
Aaron J. Ungerer, Lakewood, Ohio, assignor to The Standard Products Company, Cleveland, Ohio
Filed Jan. 28, 1969, Ser. No. 794,545
Int. Cl. F04b *49/00*
U.S. Cl. 417—211.5 **3 Claims**

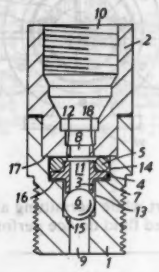


A control device responsive to liquid level in a receptacle includes first and second reciprocating pumps. The first pump has an inlet communicating with a receptacle at a predetermined level. When liquid in the receptacle reaches the predetermined level, liquid is drawn into the first pump. The first pump communicates through a passageway with the chamber of the second pump. Liquid drawn into the first pump is expelled through the passageway and into the chamber of the second pump. The presence of liquid in the chamber of the second pump prevents full stroke operation of the second pump so that a control means connected with the reciprocating arm of the second pump is rendered inoperative when liquid is supplied to the chamber of the second pump.

3,582,237
FLUID DISPLACEMENT UNITS
Max Edward Grantham, Plympton, Plymouth, Devon, England, assignor to Tecalemit Engineering Limited, Plymouth, Devon, England
Filed Oct. 18, 1968, Ser. No. 768,640
Int. Cl. F04b *17/00*
U.S. Cl. 417—377 **13 Claims**

A displacement unit for delivering quantities of fluid, particularly lubricant, in response to changes in the pressure of fluid supplied to it, comprises a housing chamber having an inlet and an outlet, first and second pistons movable in said

chamber, and resilient means biasing the first piston, and with it the second piston, towards said inlet, the first piston having a passage through it which is closed during a delivery stroke by the second piston and a restricted passage being provided past said second piston, such that the supply of fluid under pressure to the inlet moves both pistons together



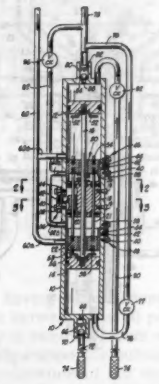
towards the outlet to discharge fluid from the chamber, fluid then entering a space behind the first piston through said restricted passage, whereas a drop in the inlet pressure causes fluid pressure in the said space to move the second piston away from the first to allow the discharge through said passage of fluid from said space.

3,582,238

DOWN HOLE HYDRAULIC PUMP

Verbol J. Devine, 2912 Epperly Drive, Oklahoma City, Okla.

Filed Apr. 30, 1969, Ser. No. 820,555
Int. Cl. F04b *17/00;* **F15b** *11/00*
U.S. Cl. 417—397 **13 Claims**



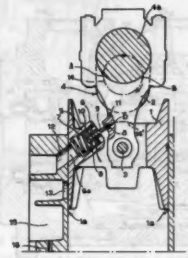
A down hole pump adapted to be driven by a power fluid circulated into the hole from the surface and including at least one main power piston, a working barrel surrounding the power pistons, a pair of power fluid charging ports in the working barrel, a pair of power fluid discharge ports in the working barrel, fluid passageways connecting the ports to the surface, and a double slide valve assembly positioned in the working barrel and cooperating with the power pistons during portions of the stroke thereof for alternately opening one of the charging ports and closing one of the discharge ports while concurrently closing the second charging port and opening the other discharge port, then, at a different time, reversing the status of the four ports. The slide valve assembly is actuated to open and close the ports at critical times by contact of at least one power piston with this assembly, coupled with the resilient bias of a spring and ball assembly cooperating with a cam surface on a portion of the slide valve assembly.

3,582,239

PISTON PUMP INCORPORATED BY A RECIPROCATING MACHINE COMPONENT OPERATED BY A CONNECTING ROD

Dante Giacosa, and Giovanni Torazza, both of Turin, Italy, assignors to Fiat Societa Per Azioni, Turin, Italy

Filed Apr. 1, 1969, Ser. No. 812,164
Claims priority, application Italy, Apr. 4, 1968, 51174-A
Int. Cl. F04b *19/02, 29/00, 21/02*
U.S. Cl. 417—466 **5 Claims**



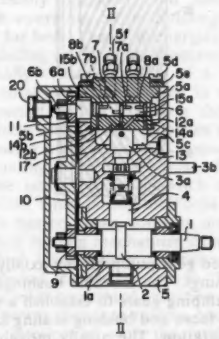
A piston pump incorporated in a reciprocating component of a machine for example in a cross head or in a balancing slide of an internal combustion engine connected by a connecting rod to a crank pin of a crank shaft. The pump comprises a piston slidable in a cylindrical bore provided in the said reciprocating component and acted upon against the action of spring means directly or indirectly by the connecting rod during the oscillations which the latter performs upon the rotation of the crank shaft. The said cylindrical bore is successively connected during the displacements of the reciprocating component along guides provided in a stationary structure with suction and exhaust ports at the beginning of each suction and exhaust stroke of the pump piston.

3,582,240

DISTRIBUTION TYPE FUEL INJECTION PUMP

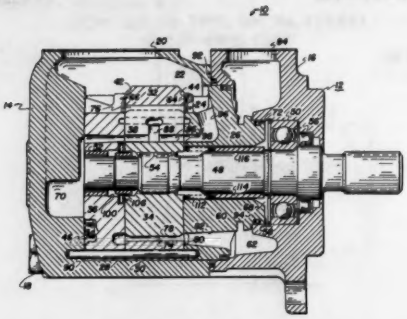
Masaaki Hokari, Hiki-gun-Saitama-ken, Japan, assignor to Diesel Kiki Kabrishiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1969, Ser. No. 810,477
Claims priority, application Japan, Apr. 1, 1968, 43/21332
Int. Cl. F04b *13/02*
U.S. Cl. 417—485 **3 Claims**



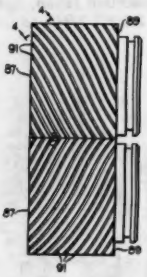
A fuel injection pump comprising a pump body with a compression plunger reciprocating by said camshaft to control a discharge amount and a distributor body with a distribution plunger having an outlet port communicating to an injection valve, these being separably connected to form a pump chamber between the distributor body and the compression plunger and an oil chamber communicating to a fuel pump and a pump chamber between the distributor body and the pump body, and an extension of the distribution plunger and the camshaft are connected means for transmitting a definite ratio of rotation.

3,582,241
POWER TRANSMISSION
Albin J. Niemiec, Sterling Heights, and Raymond B. Pettibone, Detroit, both of, Mich., assignors to Sperry Rand Corporation, Troy, Mich.
Filed Mar. 18, 1969, Ser. No. 808,194
Int. Cl. F04c 17/00; F01c 21/10
U.S. Cl. 418—107 12 Claims



A fluid pressure energy translating device of the sliding vane type having a stator with high and low pressure passages and a vane track with a vane carrying rotor rotatably mounted therein and encased between a pair of cheek plates; one of said cheek plates having a bearing mounted therein and extending therefrom into abutment with said vane carrying rotor and means for resiliently biasing said rotor towards said bearing means thereby defining a clearance space between the rotor and each of said cheek plates.

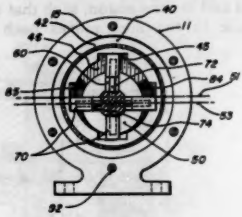
3,582,242
PRESSURE LOADED PUMP
Lowell D. Hansen, Hudson, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed May 8, 1969, Ser. No. 822,874
Int. Cl. F01c 19/08; F04c 15/00, 27/00
U.S. Cl. 418—132 5 Claims



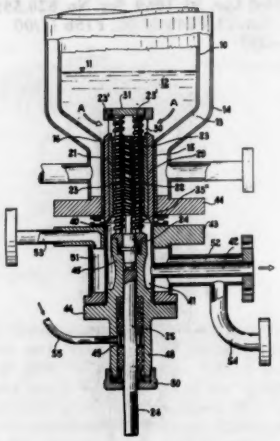
A pressure loaded gear pump having axially movable pressure loadable bushings. The movable bushings are urged axially toward the pumping gears to establish a sealing relation between gear side faces and bushing sealing faces to provide efficient pump operation. The axially movable bushings include outer peripheral surfaces including helically formed serrations or grooves. These grooves insure freedom of mobility of the bushings.

3,582,243
ROTARY FLUID DEVICE
Wallace R. Rhine, Route 2, Arcola Road, Stillwater, Minn.
Filed Sept. 15, 1969, Ser. No. 857,862
Int. Cl. F01c 1/00
U.S. Cl. 418—173 13 Claims

A rotary fluid device of the vane type useful as a pump or motor or brake which utilizes a journaled rotor ring movable therewith to eliminate frictional forces between the vanes and the stationary part while permitting an oscillatory pumping action for improved fluid device performance.



3,582,244
DEVICE FOR VOLUMETRICALLY REMOVING VISCOUS LIQUIDS FROM VACUUM OPERATING EQUIPMENTS
Francesco Siclari; Luigi Marafioti, and Franco Magnoni, all of Milan, Italy, assignors to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa, Milan, Italy
Filed Dec. 8, 1969, Ser. No. 882,837
Claims priority, application Italy, Dec. 12, 1968, 24972A/68
Int. Cl. F01c 1/16, 21/06
U.S. Cl. 418—197 7 Claims

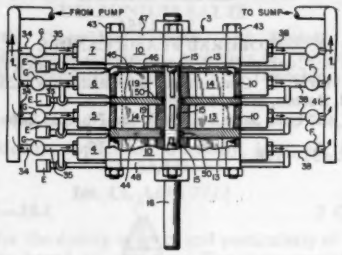


A device for volumetrically removing liquids from vacuum operating equipments, particularly reaction vessels and equipments for obtaining polymers, comprising a set of mutually engaging pumping screws, a number of which extend to the inside of the vacuum equipment for a given length, while the remaining screw or screws extend only up to the bottom of said vacuum equipment. Said set of screws is rotatably driven within a body tightly enclosing the same.

3,582,245
COMBINED PUMP AND MOTOR
Frank J. Wallace, 1657 N. Washtenaw Ave., Chicago, Ill.
Filed Jan. 13, 1969, Ser. No. 790,660
Int. Cl. F15b 11/16
U.S. Cl. 418—210 9 Claims

A combined pump and hydraulic motor comprising a plurality of independent sections at least some being of different characteristics from each other, each section comprising an impeller and an encasing housing, a driving connection

between the impellers and a valve selectively connecting these sections in parallel or in opposition in braking relation



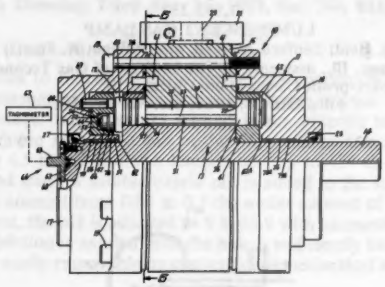
to vary the speed incrementally or in bypassing relation to certain sections to vary the torque and/or speed.

3,582,246

ROTARY FLUID DISPLACEMENT DEVICE

Bernard E. Traut, Wayzata, and Vernon A. Kiffmeyer, Watertown, both of, Minn., assignors to Washington Scientific Industries, Inc., Minnetonka, Minn.

Filed Aug. 15, 1969, Ser. No. 850,386
Int. Cl. F01c *1/00*; F03c *3/00*; F04c *1/00*
U.S. Cl. 418—264 **15 Claims**



A fluid motor having intermittently rotatable vanes sequentially movable between a radial position and a circumferential position by a circuitous cam mechanism having a third harmonic configuration for substantially constant acceleration and deacceleration of the vanes resulting in constant force on the vanes. The motor has a rotor mounted on a housing with the use of a combination sharp edge bearing and seal units. A coupling apparatus, having a flexible O-ring, is centered on the end of the drive shaft of the motor.

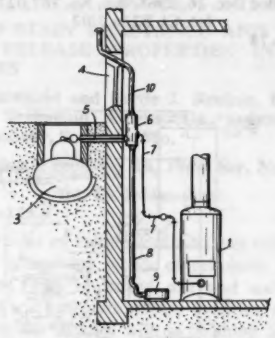
3,582,247

APPARATUS FOR DETECTING TRACES OF HEAVY COMBUSTIBLE GASES AND HEATING SYSTEMS INCORPORATING SUCH APPARATUS

Bernard Faure, 10, Boulevard d'Inkermann, Neuilly-sur-Seine, Hauts-de-Seine, France

Filed June 16, 1969, Ser. No. 833,385
Claims priority, application France, June 28, 1968, 157,121
Int. Cl. F23n *5/24*
U.S. Cl. 431—22 **5 Claims**

An arrangement for detecting traces of heavy combustible gases constituted by a gas burner fed with a combustible gas similar to that which is to be detected and with combustive air tapped out of the atmosphere to be detected, said burner being adjusted in a manner such that its flame is metastable and released and extinguished as soon as the contents of



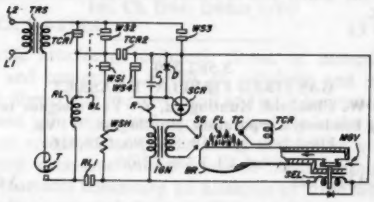
combustible gas in the air thus tapped off and thereby in the mixture fed into the burner rise up to a predetermined figure.

3,582,248

FLUID FUEL BURNER CONTROL WITH PURGE

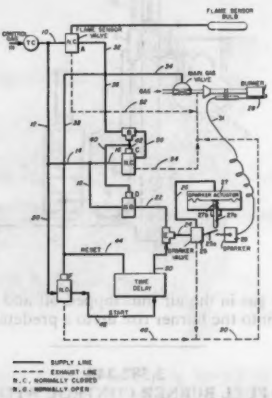
Gerald E. Dietz, Milwaukee, Wis., assignor to Penn Controls, Inc., Oak Brook, Ill.

Filed Nov. 3, 1969, Ser. No. 873,245
Int. Cl. F23n *5/00*
U.S. Cl. 431—29 **4 Claims**



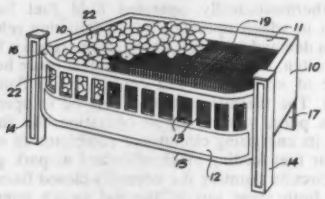
A thermostatically operated fluid fuel burner control system in which operation of an initiating relay is effected upon a demand for heat. The relay energizes a thermal safety time switch, including an electrical resistance heater, through a pair of normally closed contacts of a flame responsive switch. The thermal switch, is delayed in operation to provide a purge period. Upon operation the thermal switch opens its energizing circuit and completes an energizing circuit for fuel feeding mechanism and a spark generator, the later circuits shunting the normally closed flame switch contacts. Both these sets of thermal switch contacts latch in operated condition. Thus, during the "cool down" period of the warp switch heater, these contacts maintain the spark generator and fuel feeding mechanism energized to attempt ignition of the fuel. Upon failure of ignition to occur during this timed trial period, the system goes to "lock out," requiring release of the relay by manual actuation of the thermostat to interrupt the power circuit to resume operation. The relay is mechanically interlocked with the latched warp switch contacts, and upon release, cams them into their initial condition for a new attempt at ignition. After a successful ignition, the warp switch, upon cooling, actuates a pair of contacts to stop operation of the spark generator, while maintaining the fuel feeding means in operation. Any temporary power interruption to the control circuit causes the initiating relay to release, interrupting feeding of fuel, while the mechanical interlock cams the previously mentioned warp switch contacts to their initial condition such that reoperation of the relay for a new trail for ignition must first await cool down of the flame responsive switch, which is of the time delay type (such as a thermocouple).

3,582,249
PILOTLESS AUTOMATIC IGNITION DEVICE
Robert A. Hodgson, Tulsa, Okla., assignor to Maloney-Crawford Tank Corporation, Tulsa, Okla.
Filed Dec. 26, 1968, Ser. No. 787,027
Int. Cl. F23n 5/02
U.S. Cl. 431—74 1 Claim



The gas supply to a burner to ignite same is used as the source of energy for ignition eliminating the usual pilot light. A time delay and safety interlock provide for gas shut-off in the event of burner flame-out. The apparatus includes gas controlled flame sensor valve and time delay mechanism and the system is adaptable to existing equipment using a pilot light as the ignitor and in which the pilot does not continue burning.

3,582,250
GAS FIRED FIREPLACE BASKET
William W. Chatfield, Huntington, W. Va., assignor to Armstrong Products Corporation, Huntington, W. Va.
Filed June 2, 1969, Ser. No. 829,616
Int. Cl. F23h 13/00
U.S. Cl. 431—125 3 Claims

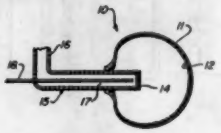


A gas fired fireplace basket which simulates a coal fire and incorporates a plurality of gas burners beneath a screen which in turn supports a plurality of pieces of noncombustible material in a loosely disposed shallow layer. A transversely extending deepened pocket in the screen locates pieces of the noncombustible material adjacent cut away areas in the front portion of the fire basket.

3,582,251
COLORED FLAME CANDLE
Nathan K. Concannon, deceased, late of Jamaica Plain, Mass. (by Maria P. Concannon, administratrix, 25 Lakeville Road, Boston, Mass. 02130)
Filed June 11, 1969, Ser. No. 833,246
Int. Cl. F23q 2/32
U.S. Cl. 431—126 8 Claims

A candle comprising a combustible body having a major proportion of polyethylene glycol, trimethylol propane, tristearyl citrate or mixtures thereof, and at least two spaced combustible wicks embedded in said body; the body may contain also minor amounts of flame modifier and/or heat-decomposable flame-coloring ingredient.

3,582,252
LUMINESCENT GAS LAMP
Jack M. Reid; Sanford A. Weil, and William R. Staats, all of Chicago, Ill., assignors to The Institute of Gas Technology, a not-for-profit Corporation, Chicago, Ill.
Filed Oct. 20, 1969, Ser. No. 867,481
Int. Cl. F23l 17/00
U.S. Cl. 431—242 9 Claims



A light source which includes, generally, an evacuated light-transmitting envelope, the interior surface of which is coated with phosphors of the type which are excited by "active" (dissociated) gases to produce visible light. The envelope further includes a gas-fired high temperature energy source of radiant energy, and a gas which dissociated in the presence of this energy source of radiant energy.

3,582,253

DYEING HUMAN HAIR WITH DIAZONIUM SALTS

Peter Berth, Dusseldorf-Benrath, and Rudolf Maul, Hilden-Rhineland, Germany, assignors to Therachemie chemisch therapeutische Ges. m.b.H., Dusseldorf, Germany

No Drawing. Filed Feb. 20, 1968, Ser. No. 706,758

Claims priority, application Germany, Mar. 14, 1967, T 33,431

Int. Cl. A61k *7/12*

U.S. Cl. 8—10.1 **7 Claims**

Agents for the dyeing of hair, and particularly of living human hair, based on azo dyes. The dyes consist of a diazo- and a coupling component, which are caused to react with each other while on the hair. The diazo component consists of stable diazonium salts. Both components are applied in the form of aqueous solutions. Application to the hair can be carried out within 5 to 30 minutes and at temperatures of substantially 15 to 35° C., i.e., substantially at room temperature.

3,582,254

UNHAIRING HIDES

Martin K. O. Lindemann, Rockville, Md., and Jacob J. Guth, Arlington, Va., assignors to The Gillette Company, Boston, Mass.

No Drawing. Filed Apr. 16, 1969, Ser. No. 816,781

Int. Cl. C14c *1/06*

U.S. Cl. 8—94.16 **3 Claims**

Hides to be converted to leather are rendered suitable for mechanical unhairing in a two-stage process. In the first stage, the hides are soaked in an aqueous solution containing soluble sulfite or bisulfite and urea at a pH from 4.5 to 9.0 and at a temperature up to 42° C. In the second stage, a soluble cupric salt is added to the solution in an amount from 0.01 to 0.1 the molar amount of sulfite present, the pH is adjusted to 9.8–10.9 with ammonia, and the solution is aerated until the hair is sufficiently loosened to be easily removable by conventional mechanical means.

3,582,255

PROCESS FOR STRIPPING DYEINGS AND PRINTS FROM HYDROPHOBIC FIBRES

Bruno Kissling, Riehen, Basel-Stadt, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz A.G.), Basel, Switzerland

No Drawing. Filed May 16, 1968, Ser. No. 729,498

Claims priority, application Switzerland, May 26, 1967, 7,487/67

Int. Cl. D06l *3/00*

U.S. Cl. 8—102 **14 Claims**

A process for stripping dyeings or prints produced with non-fibre-reactive disperse dyes on hydrophobic fibres, which process consists in treating the dyed fibres at temperatures above 90° C. with an amount of at least 0.5% (on the weight of the dyed fibres)of a non-ionic compound of the polyglycol ether series which is soluble to at least 3% in water at 20° C. and which contains per polyglycol ether chain 1 hydrophobic radical having 12 to 26 carbon atoms.

3,582,256

SOIL AND STAIN RESISTANCE AND SOIL AND STAIN RELEASE PROPERTIES IN TEXTILE ARTICLES

Julian J. Hirshfeld and Bertie J. Reuben, Decatur, and John W. Bullington, Athens, Ala., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 10, 1968, Ser. No. 728,339

Int. Cl. D06m *9/00*

U.S. Cl. 8—115.6 **13 Claims**

Textile articles of cellulosic fibers, non-cellulosic fibers and articles comprising blends of cellulosic and non-cellulosic fibers, with improved soil and stain resistance qualities and soil and stain release qualities, are produced by contacting the articles with a finishing mixture comprising an aldehyde-releasing compound, animal glue and a plasticizer for the animal glue; and by curing the finish.

3,582,257

SOIL AND STAIN RESISTANCE AND SOIL AND STAIN RELEASE PROPERTIES IN TEXTILE ARTICLES

Julian J. Hirshfeld and Bertie J. Reuben, Decatur, and John W. Bullington, Athens, Ala., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 10, 1968, Ser. No. 728,340

Int. Cl. D06; D06m *9/00*

U.S. Cl. 8—115.6 **13 Claims**

Textile articles of cellulosic fibers, of non-cellulosic fibers and comprising blends of cellulosic and non-cellulosic fibers, with improved soil and stain resistance qualities, and with minimised odor and toxicity in the finished product, are produced by contacting the articles with conventional press-free crease-retention thermosetting resin finish reactants containing an aldehyde or from which an aldehyde is released during polymerization thereof, animal glue, and a plasticizer; and by curing the resin.

3,582,258

FLAME-RETARDANT ACRYLONITRILE POLYMERS

Denis Coleman, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 532,517, Feb. 21, 1966. This application July 25, 1969, Ser. No. 845,090

Int. Cl. C08f *3/78, 45/00*; C08k *1/60*

U.S. Cl. 8—115.5 **10 Claims**

Acrylic fibers having improved flame-retardancy and good luster comprising an acrylonitrile polymer combined with 2.0–15.0% of an aziridinylphosphine oxide or sulfide based on the weight of fiber. Such fibers are made by applying a solution of an aziridinylphosphine oxide or sulfide to fibers of acrylonitrile polymer while such fibers are in the gel state and thereafter heating the treated gel until the aziridinylphosphine compound has chemically combined with the polymer. The preferred aziridinylphosphine compound used is tris-aziridinylphosphine oxide.

3,582,259

METHOD OF TREATING HAIR TO IMPROVE QUALITY AND "HOLD" OF "SETS" IMPARTED THERETO

Grégoire Kalopissis and Paul Roussopoulos, Paris, and Charles Zviak, Franconville, France, assignors to Societe Anonyme dite: L'Oreal

No Drawing. Filed Jan. 5, 1967, Ser. No. 607,372
Claims priority, application Luxembourg, Jan. 7, 1966, 50,215
Int. Cl. A61k *7/10, 13/00;* D06m *3/00*
U.S. Cl. 8—127.51 8 Claims

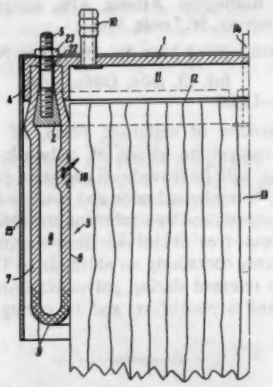
A method of improving the quality and "hold" of a "set" imparted to the hair, which method comprises the steps of applying a reducing agent to said hair while it is moist and unconstrained, and then neutralizing it, said steps being carried out before the hair is "set."

3,582,260

END CAP FOR IMPREGNATING WOOD ESPECIALLY SAP-FRESH BARK-COVERED TREE TRUNKS AGAINST ROT AND INSECTS

Martin Gersonde, Christoph Kottlors, and Fritz Schwartz, Berlin, Germany, assignors to Dr. Wolman G.m.b.H., Baden, Germany

Filed May 3, 1968, Ser. No. 726,459
Claims priority, application Germany, May 19, 1967, G 50,127; Dec. 20, 1967, G 38,611
Int. Cl. B27k *3/10*
U.S. Cl. 21—71 12 Claims



An end cap for impregnating wood, especially a bark-covered sap-fresh tree trunk, having a rigid section with provisions for connecting a source of wood-impregnating solution thereto and an elastic section which forms a liquid-tight chamber between the rigid section and the tree trunk.

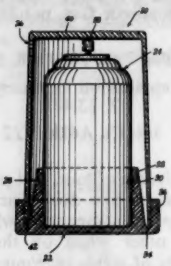
3,582,261

SANITIZER CONSTRUCTION

Dan M. Price, 804 N. Montgomery, Litchfield, Ill. 62056

Filed May 7, 1969, Ser. No. 822,495
Int. Cl. A61l *3/00*
U.S. Cl. 21—77 6 Claims

Drinking glass sanitizer unit which includes a base of modified cup configuration of impregnatable resilient material, as plastic foam, having an integral concentric annular wall the inner side of which is cylindrical and the outer side of which slopes outwardly downwardly to an annular groove adjacent and below the defining wall of the cup. An aerosol container with antiseptic liquid therein is mounted within the wall and is secured against removal, as with cement. A plastic drinking glass is disposed in inverted position about the aerosol container with the rim disposed in the annular groove and against the defining wall, the bottom of the glass being substantially contiguous to the operating push button of the aerosol container. Downward pressure on the bottom of the glass effecting



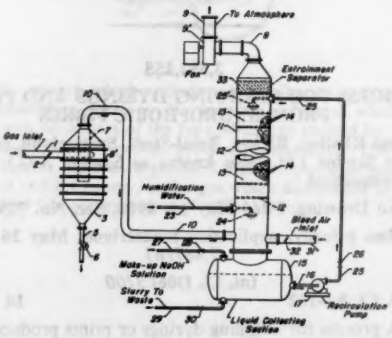
downward movement permitted by the resilient material of the base operates the aerosol container valve to spray antiseptic within the glass to sanitize the same for the next user. The rim supporting groove and adjacent walls are impregnated with micro-encapsulated or liquid antiseptic or minimal evaporation type for sanitizing the rim of the glass.

3,582,262

MULTIPLE STAGE METHOD FOR REMOVING CHLORINE AND ENTRAINED ALUMINUM CHLORIDE PARTICLES FROM A WASTE GAS STREAM

James P. Tomany, Darien, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 432,675, Feb. 15, 1965. This application Dec. 27, 1968, Ser. No. 787,485
The portion of the term of the patent subsequent to May 20, 1986, has been disclaimed
Int. Cl. B01d *47/06, 47/12*
U.S. Cl. 23—2R 8 Claims



A multiple stage system for removing chlorine and aluminum chloride particles from a hot gaseous stream which embodies an initial condensation step, preferably of the nature of a centrifuging-cooling zone, so as to provide a partial cooling of the stream and effect some collection of sublimed aluminum chloride particles and then, subsequently, there is a countercurrent scrubbing of the partially cooled laden gaseous stream in the presence of

at least one bed of loose mobile contact elements. A preferred operation may also incorporate a cooling-humidification stage directly ahead of the scrubbing stage.

3,582,263

SOLVENT EXTRACTION PROCESS FOR SEPARATING GADOLINIUM FROM TERBIUM AND DYSPROSIUM

Vincent Chiola, Tai K. Kim, and Robert E. Long, Jr., Towanda, and Brooks C. Martin, State College, Pa., assignors to Sylvania Electric Products Inc.

No Drawing. Filed Oct. 31, 1969, Ser. No. 873,128
Int. Cl. C01f 17/00; C22b 59/00
U.S. Cl. 23—22 7 Claims

A process for the purification of gadolinium wherein an aqueous solution containing gadolinium values and heavy rare earths is contacted with an organic extraction solution consisting essentially of didecyl phosphoric acid, tributyl phosphate and an aliphatic hydrocarbon solvent to thereby remove an appreciable amount of the heavy rare earths into the organic phase without an appreciable removal of gadolinium from the aqueous phase.

3,582,264

PROCESS FOR SEPARATING RARE EARTHS

Vincent Chiola, Joseph J. Cleveland, and George J. Kamin, Towanda, Pa., assignors to Sylvania Electric Products Inc.

Filed Sept. 16, 1969, Ser. No. 858,340
Int. Cl. C01f 17/00; C22b 59/00
U.S. Cl. 23—23 4 Claims

In the process for separating the lighter rare earth elements from heavier rare earth elements wherein an aqueous feed stream containing a mixture of both lighter and heavier rare earth elements flows through a plurality of extraction stages and an organic extractant solution that preferentially extracts the heavier rare earth elements flows counter-current to and in contact with the aqueous feed stream, the resulting loaded organic solution is separated from the aqueous solution, scrubbed with an aqueous scrub solution, separated therefrom and used as a feed for further separation, an improvement is achieved by adjusting the pH of the scrub solution after the scrubbing step to between about 5 and about 7 and adding the adjusted scrub solution to an extraction stage downstream from the feed solution entry stage. Improvements in extraction and scrubbing efficiency are achieved.

3,582,265

DIBASIC MAGNESIUM HYPOCHLORITE

John J. Bishop, Enon, Ohio, and Samuel I. Trotz, Orange, Conn., assignors to Olin Corporation

No Drawing. Filed June 2, 1969, Ser. No. 829,795
Int. Cl. C01d; C01f; C01g
U.S. Cl. 23—50 4 Claims

Dibasic magnesium hypochlorite compositions containing 90% or more of $Mg(OCl)_2 \cdot 2Mg(OH)_2$ and from 52 to 60% available chlorine are prepared by adding concentrated alkaline solutions of a water-soluble hypochlorite slowly to concentrated acid solutions of magnesium salts and separating the precipitated dibasic magnesium hypochlorite.

3,582,266

PROCESS FOR PRODUCING BARIUM FERRITE

Samuel W. Sopp and Leo F. Heneghan, San Mateo, Calif., and Jack R. Anderson, Whippany, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Sept. 24, 1968, Ser. No. 762,154
Int. Cl. C01f 11/00; C01g 49/00
U.S. Cl. 23—51 6 Claims

Barium ferrite is prepared by reacting a ferrous sulfate solution with a carbonate precipitating agent to produce a ferrous hydroxycarbonate slurry which is filtered. Barium carbonate is added to form a barium-iron carbonate co-slurry which is dried and conveted to the ferrite by calcination. In another embodiment, barium chloride is added to the ferrous hydroxycarbonate and a carbonate added to precipitate barium carbonate on the hydroxycarbonate particles. The addition of a carbonate to a solution of barium chloride and ferric chloride to precipitate an iron-barium hydroxycarbonate co-precipitate is also disclosed. Calcination of the co-precipitate yields barium ferrite.

3,582,267

PROCESS FOR THE PREPARATION OF SOLID WHITE SODIUM STANNATE FROM TECHNICAL SODIUM STANNATE LIQUOR

Erich Ruf, Essen, Germany, assignor to Th. Goldschmidt A.G., Essen, Germany

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,068
Int. Cl. C01g 19/00
U.S. Cl. 23—53 1 Claim

This invention relates to a process for the preparation of solid white sodium stannate from technical sodium stannate liquor by the addition of concentrated caustic soda solution, and is the improvement which comprises treating the crude contaminated sodium stannate liquor, prior to the addition of caustic soda solution, at a temperature above 40° C. with a compound selected from the group consisting of potassium permanganate in a quantity in the range of 50 to 70 percent by weight of the quantity required by determining the permanganate number or an oxidation-equivalent amount of sodium hypochlorite, separating solid material, and reacting the remaining liquor with up to about 0.1 percent by weight, based on the weight of sodium stannate liquor, of a mixture containing at least one sulfated oleic acid amide compound and at least one oleic acid amide compound.

3,582,268

METHOD OF TREATING BAUXITE WITH ALKALI

Chosei Sato and Yasunori Yamada, Yokohama-shi, and Masakatsu Sakamoto, Tokyo, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Oct. 14, 1968, Ser. No. 767,442
Claims priority, application Japan, Oct. 14, 1967, 42/65,696
Int. Cl. C01f 7/02
U.S. Cl. 23—52 2 Claims

A method of treating bauxite with alkali in the manufacture of alumina wherein bauxite slurries are introduced into a reactor by a pump operated by a caustic soda solution pressurized for use as a driving medium at a higher pressure than that of the reactor in operation. The caustic soda solution is conducted to a booster to be pressurized for pump operation, and, after leaving the booster, is partly supplied to the reactor to react with the bauxite charged therein.

3,582,269

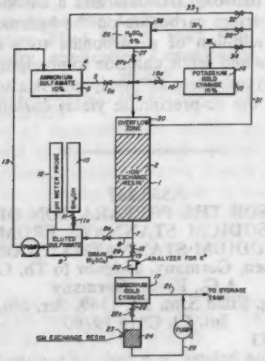
PRODUCTION OF AMMONIUM GOLD CYANIDE

Carl D. Keith, Summit, Alfred J. Haley, Jr., Florham Park, Kenneth D. Baker, Bridgewater, Somerville, and Peter Epstein, Sayerville, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Newark, N.J.

Filed July 3, 1969, Ser. No. 838,946
Int. Cl. C01c 3/08; C01g 7/00; P22c 7/00
U.S. Cl. 23—79 8 Claims

An ion exchange process is provided for producing ammonium gold cyanide. The process includes providing a cation exchange resin in ammonium form, e.g. by passing a solution containing an aqueous ammonium salt into contact with a cation exchange resin in hydrogen form

to convert the resin to the ammonium form, and subsequently treating the cation exchange resin in ammonium



form with a solution containing an alkali gold cyanide to produce ammonium gold cyanide.

3,582,270
PROCESS FOR THE RECOVERY OF OSMIUM TETROXIDE
James Harkema, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Filed May 23, 1968, Ser. No. 731,609
Int. Cl. C01g *55/00*
U.S. Cl. 23—140 **9 Claims**

A process for the recovery of osmium tetroxide from a reaction mixture resulting from the oxygenation of a $\Delta^{17\,(20)}$-21-acyloxy steroid in an organic solvent with osmium tetroxide and an oxidizing agent to obtain the corresponding 17-hydroxy-20-keto-21-acyloxy steroid, which comprises treating said reaction mixture with thiourea under aqueous acidic conditions to produce an osmium thiourea complex; separating the osmium thiourea complex thus obtained from the reaction mixture in an aqueous phase and oxidizing the osmium thiourea complex with hydrogen peroxide to obtain osmium tetroxide which is recovered from the aqueous phase in accordance with methods known in the art, such as by extraction with water immiscible organic solvent or by distillation.

3,582,271
METHOD FOR MANUFACTURING ALUMINA WHISKERS
Shigekazu Minagawa, Tetuo Gejo, and Tadashi Saito, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed July 11, 1968, Ser. No. 744,004
Claims priority, application Japan, July 14, 1967, 42/45,059
Int. Cl. C01s *7/30*
U.S. Cl. 23—142 **6 Claims**

Alumina whiskers having a high strength are manufactured in a high yield by passing a hydrogen gas containing water vapor having a partial pressure of not more than 5×10^{-4} atm. and aluminum chloride having a partial pressure of 6×10^{-6} to 2×10^{-3} atm. over aluminum or its alloys heated to 1400 to 1600° C. and conducting reaction of aluminum vapor with water vapor in the presence of aluminum chloride vapor.

Alumina whiskers are useful as a reinforcing material for synthetic resin or metallic material.

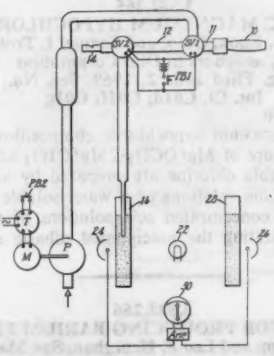
3,582,272
PROCESS FOR THE PREPARATION OF CRYSTALLINE HEXAGONAL BORIC OXIDE
Lyman S. Stanton, Martinez, Calif., assignor to Stauffer Chemical Company, New York, N.Y.
Filed July 11, 1966, Ser. No. 564,344
Int. Cl. C01b *35/00*
U.S. Cl. 23—149 **6 Claims**

A process for the preparation of crystalline hexagonal boric oxide by first heating a mixture of at most approximately 8 to 10 weight percent boric acid or metaboric acid (Type II) in the presence of a 92 to 90 weight percent bed of crystalline hexagonal boric oxide at a temperature above the melting point of metaboric acid (Type II), and below the temperature at which the crystals of hexagonal boric oxide melt for a time sufficient to convert the boric acid or metaboric acid (Type II) to crystalline hexagonal boric oxide. The next step is agitating the heated mixture of boric acid or metaboric acid (Type II) and crystalline boric oxide bed to prevent agglomeration of the crystallizing boric oxide.

3,582,273
PROCESS FOR THE PRODUCTION OF ALKALI METAL HYDROXIDES
Ichiro Takeuchi and Yutaka Nagao, Kitajima-machi, Itano-gun, and Haruo Okada, Kamojima-machi, Oe-gun, Tokushima Prefecture, Japan, assignors to Toho Rayon Co., Ltd., Tokyo, Japan
No Drawing. Filed July 22, 1968, Ser. No. 746,323
Claims priority, application Japan, July 20, 1967, 42/46,850
Int. Cl. C01d *1/04*; C01f *4/46*
U.S. Cl. 23—184 **11 Claims**

A process for producing alkali metal hydroxide from an alkali metal sulfate whereby said sulfate is reacted in an aqueous medium with a mercaptan and calcium hydroxide or calcium oxide so as to form an alkali metal mercaptide and thereafter hydrolyzing said mercaptide so as to form said alkali metal hydroxide.

3,582,274
METHODS OF ANALYZING BREATH FOR ETHYL ALCOHOL
Frederick G. Keyes, 15 Berkeley St., Cambridge, Mass. 02138
Filed June 24, 1969, Ser. No. 835,943
Int. Cl. C09k *3/00*; G01n *31/22, 33/16*
U.S. Cl. 23—232 **6 Claims**



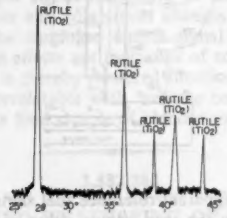
In the quantitative analysis for ethyl alcohol of a sample of breath by the method comprising contacting the sample with a solution of chromate ions and measuring the decrease of chromate ion concentration, the sample

is contacted with a solution comprising a chromate compound in aqueous nitric acid. The oxidation reaction of breath alcohol with this solution has a rapidity suitable for every practical purpose in breath testing for alcohol.

3,582,275
PROCESS FOR THE PREPARATION OF TITANIUM OXIDE

Yujiro Sugahara, Tokyo, and Hiroyuki Naito, Kouichi Usui, and Akira Takahashi, Tsuruoka-shi, Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1968, Ser. No. 733,708
Claims priority, application Japan, June 3, 1967, 42/35,161
Int. Cl. C01g *23/04, 23/08*
U.S. Cl. 23—202 **4 Claims**

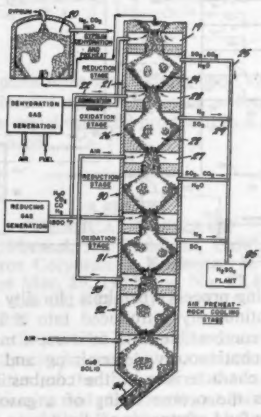


A process for the preparation of titanium oxide, especially titanium oxide of rutile type, which comprises mixing a titanium salt of phosphorus oxoacid with at least an equivalent quantity, to the phosphorus oxoacid component in the salt, of at least one phosphorus oxoacid-binder selected from the group consisting of oxides, hydroxides, and salts capable of producing oxides under the subsequent drying or calcining conditions, of alkali metals, alkaline earth metals, aluminium and zinc, and thereafter drying or calcining the mixture.

3,582,276
PROCESS FOR RECOVERING A METAL OXIDE AND SULFUR DIOXIDE FROM METAL SULFATE

Roy Edwin Campbell and Edwin Eddie Fisher, Midland, Tex., assignors to Elcor Chemical Corporation, Midland, Tex.

Filed July 22, 1968, Ser. No. 746,638
Int. Cl. C01b *17/50, 17/72*
U.S. Cl. 23—177 **14 Claims**

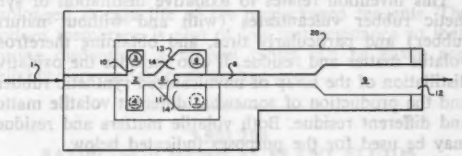


A metal sulfate is converted to a metal oxide and sulfur dioxide by subjecting it to a series of reduction and oxidation steps. During the reduction steps, the sulfate present is converted to sulfur dioxide, the metal sulfide and the metal oxide. The subsequent oxidizing step converts the metal sulfide to sulfur dioxide, metal oxide, and a small amount of metal sulfate. The sulfur dioxide is collected in any suitable manner, and the reduction and oxidation cycle is repeated until a metal oxide of desired purity is obtained.

3,582,277
PROCESS FOR CARBON BLACK PRODUCTION

Gerard Kraus, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed June 27, 1968, Ser. No. 740,540
Int. Cl. C09c *1/50*
U.S. Cl. 23—209.4 **6 Claims**

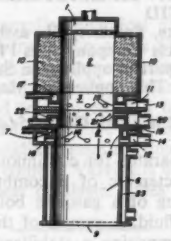


Process and apparatus for the production of carbon black wherein a hydrocarbon feed is contacted with two generally countercurrent impinging masses of hot combustion gases and the resulting mixtures passed into a reaction zone wherein the hydrocarbon feed is pyrolytically decomposed into carbon black.

3,582,278
METHOD FOR PRODUCING TITANIUM DIOXIDE PIGMENT

Achim Kulling, Opladen, Hans Steinbach, Bergisch Gladbach, and Hermann Trueb, Opladen, Germany, assignors to Titangesellschaft m.b.H., Leverkusen, Germany

Original application Apr. 24, 1968, Ser. No. 723,700. Divided and this application Dec. 3, 1969, Ser. No. 881,724
Claims priority, application Germany, June 3, 1967, T 34,024
Int. Cl. C01g *23/04*
U.S. Cl. 23—202 **5 Claims**



The present application is a division of application Ser. No. 723,700, filed Apr. 24, 1968, and relates to a novel method for producing a rutile TiO_2 pigment by a vapor phase process wherein the heat required for the reaction of the gaseous $TiCl_4$ with oxygen is provided by a column of hot combustion gases which fills the entire cross-section of a pre-combustion chamber immediately preceding a feeding ring designed to introduce gaseous $TiCl_4$

into the column of hot gases from a multiplicity of radial apertures surrounding the column of hot combustion gases and lying in a common plane substantially at right angles to its longitudinal axis, the reaction of the $TiCl_4$ with the O_2 in said hot gases taking place within a relatively short reaction zone immediately succeeding the $TiCl_4$ feeding ring thus insuring high reaction temperatures, short reaction time, uniform residence time and no reverse currents in the reaction zone.

3,582,279

OXIDATIVE DISTILLATION OF RUBBER VULCANIZATE

Joseph A. Beckman and Edward L. Kay, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 19, 1969, Ser. No. 825,550
Int. Cl. C01b *31/02;* **C10b** *57/04*
U.S. Cl. 23—209.2 **11 Claims**

This invention relates to oxidative distillation of synthetic rubber vulcanizates (with and without natural rubber) and particularly tires, and obtaining therefrom volatile matter and residue. It also includes the oxidative distillation of the scrap of unvulcanized synthetic rubbers and the production of somewhat different volatile matter and different residue. Both volatile matters and residues may be used for the purposes indicated below.

The volatile matter yields gaseous materials and an oil. The oil comprises a complex mixture of aliphatic, olefinic and aromatic hydrocarbon and oxidation products thereof. Included are monomers, for example butadiene and/or isoprene and/or styrene, and/or isobutylene depending upon the composition of the rubber that is distilled. One or more oil fractions may be collected. They may be polymerized to make a plastic resin suitable for molding, etc. On hydrogenation the oil will form a fuel suitable for internal combustion engines. It may be used as a fuel for the rubber distillation and elsewhere.

The volatile material may be used as a feed stock for a cracking operation in the production of ethylene, propylene, etc.

Residual material as recovered from the retort may be used as a reinforcing agent or filler for rubber vulcanizate, a filtering agent for the purification of water, decolorizing organic materials, sewage treatment, etc.

The gas from both polymer and vulcanizate distillation includes a substantial amount of butadiene, and isoprene monomers.

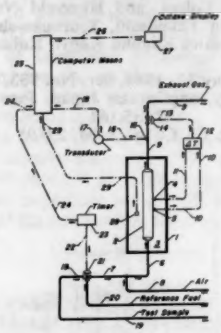
3,582,280

METHOD AND APPARATUS FOR DETERMINING A COMPOSITION CHARACTERISTIC OF A COMBUSTIBLE FLUID

Ellsworth R. Fenske, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 679,328, Oct. 31, 1967. This application May 15, 1970, Ser. No. 37,639
Int. Cl. F23n *5/00;* **G01n** *25/46, 33/22*
U.S. Cl. 23—230 **25 Claims**

Method and apparatus for continuously determining a composition characteristic of a combustible fluid, such as the octane rating of a gasoline boiling range hydrocarbon-containing fluid. A sample of the fluid is oxidized in an analyzer comprising a stabilized cool flame generator with a servo-positioned flame front. The position of the flame front is automatically detected and utilized to manipulate a combustion parameter, such as pressure, temperature, fluid flow, or oxidizer flow, in a manner sufficient to immobilize the flame front regardless of fluctuations in composition characteristic of the fluid sample. Changes in combustion parameter which are required to immobilize the flame front are correlatable with changes in composition characteristic, and means is provided for sensing the manipulated combustion parameter and developing therefrom a condition output signal which is functionally representative of and correlatable with composition characteristic. A suitable reference fuel of known composition characteristic is periodically passed to the analyzer in place of the fluid sample and an analyzer temperature is sensed. Means is provided to compensate the condition output signal for any deviation in the



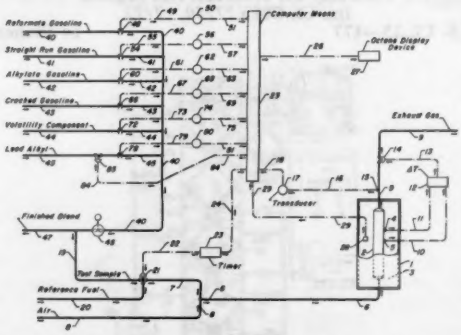
signal between apparent reference fuel signal and a signal corresponding to the true known value of reference fuel composition characteristic, and to further compensate the condition output signal for temperature fluctuations, whereby the condition output signal is compensated for combustion effects not indicative of composition characteristic, and is thereby functionally representative of and correlatable with the true composition characteristic of the fluid sample.

3,582,281

DETERMINATION AND CONTROL OF A COMPOSITION CHARACTERISTIC WHILE BLENDING A MULTICOMPONENT COMBUSTIBLE FLUID

Ellsworth R. Fenske, Palatine, and Robert W. Sampson, Arlington Heights, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed May 15, 1970, Ser. No. 37,640
Int. Cl. F23m *5/00;* **G01n** *25/46, 33/32*
U.S. Cl. 23—230 **24 Claims**



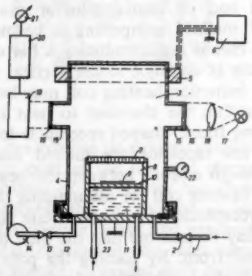
In a blending process wherein a plurality of component fluids is continuously introduced into a blending zone producing a combustible fluid mixture, a method and apparatus for continuously determining and controlling a composition characteristic of the combustible fluid mixture, such as the octane rating of a gasoline blend. A sample of the fluid mixture is oxidized in an analyzer comprising a stabilized cool flame generator with a servo-positioned flame front. The position of the flame front is

automatically detected and utilized to manipulate a combustion parameter in a manner sufficient to immobilize the flame front regardless of fluctuations in composition characteristic of the fluid sample. Changes in combustion parameter which are required to immobilize the flame front are correlatable with changes in composition characteristic, and means is provided for sensing the manipulated combustion parameter and developing therefrom a condition output signal which is functionally representative of and correlatable with composition characteristic. A suitable reference fuel of known composition characteristic is periodically passed to the analyzer in place of the fluid sample, and means is provided to compensate the condition output signal for any deviation in the signal between apparent reference fuel signal and a signal corresponding to the true known value of reference fuel composition characteristic. Means is also provided for adjusting the condition output signal responsive to analyzer temperature fluctuations and component changes in the blending zone. Thus, the condition output signal is compensated for combustion effects not indicative of composition characteristic, and is thereby rendered functionally representative of and correlatable with the true composition characteristic of the fluid sample of blended product.

3,582,282
PROCESS AND AN APPARATUS FOR THE ACCELERATED WEATHERING OF PIGMENTED VEHICLE SYSTEMS

Günther Kämpf and Hans-Georg Völz, Krefeld-Bockum, and Hans-Georg Fitzky, Odenthal-Hahnenberg, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 6, 1968, Ser. No. 750,736
Claims priority, application Germany, Aug. 7, 1967, F 53,167
Int. Cl. G01m *17/00*
U.S. Cl. 23—230 **16 Claims**



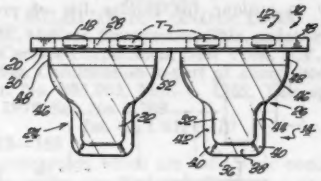
Pigmented paint films which chalk upon aging, are subjected to accelerated aging, employing as the accelerating means radicals which may be produced in a gas to which the film is exposed.

3,582,283
CHEMICAL PACKAGE

Salustiano S. Mirasol, Jr., Pasadena, Calif., assignor to Xerox Corporation, Rochester, N.Y.

Filed Mar. 25, 1970, Ser. No. 22,473
Int. Cl. G01n *21/00, 33/16*
U.S. Cl. 23—253 **23 Claims**

A storage section, suitable for use as a component of a disposable test package, comprising a plate having a thickness on the order of the thickness of the reagent tablets to be stored therein, said plate having at least one reagent storage cavity extending therethrough, one or more holes or channels adjacent each cavity to guide a plunger through the storage cavity during reagent dispensing, and top and bottom membranes adapted to hold one or more reagent tablets in position within the reagent storage cavities. The storage section can be an assembled part of the disposable test package or it can be a separate component positioned adjacent thereto during reagent dispensing.

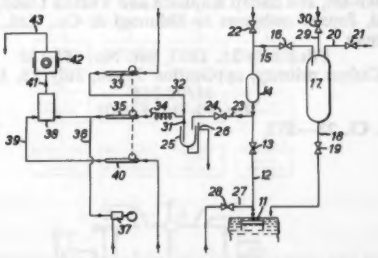


The top and bottom membranes have particular barrier properties to ensure the proper environmental control for prolonged storage life of the prepackaged reagents. The bottom membrane is also of low tear resistance so that, during dispensing, a reagent tablet can be easily and reliably dispensed from its storage cavity.

3,582,284
SAMPLING CHEMICAL PLANT FLUIDS AND NOVEL VALVES

Wilfred C. Hamshere, Holmbrook, and Thomas W. L. Atkinson, Whitehaven, England, assignors to Marchon Products Limited, London, England

Filed Oct. 11, 1967, Ser. No. 674,495
Claims priority, application Great Britain, Oct. 14, 1966, 46,171/66
Int. Cl. B01d *23/24;* **F16l** *55/14;* **G01n** *21/26*
U.S. Cl. 23—253 **10 Claims**



A system for sampling chemical plant fluids in which the sample is withdrawn through a filter and the filtered fluid passed through a sample vessel to a reservoir. When the fluid in the sample vessel is clear the flow is halted and the clear fluid transferred to a holding vessel while the filter is backwashed. Sample fluid is continuously withdrawn from the holding vessel for analysis, e.g., to determine the sulphate content. Valving is by the alternate constriction of two sets of elastic tubes by a reciprocating piston.

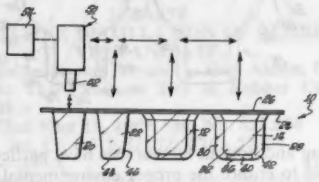
3,582,285
CHEMICAL PACKAGE

Donald A. Hamilton, Pasadena, Calif., assignor to Xerox Corporation, Rochester, N.Y.

Filed Mar. 19, 1970, Ser. No. 20,988
Int. Cl. G01n *21/00, 33/16*
U.S. Cl. 23—259 **26 Claims**

A disposable test package comprising a unitary member formed into a plurality of compartments for the admixing and reaction of reagents and sample material

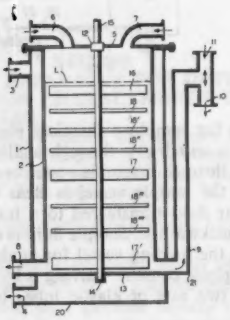
added thereto, and a plurality of reagent storage chambers associated with each reaction compartment but not adapted for direct communication therewith; and means overlying said unitary member for preventing the premature dispensing of prepackaged reagents from their storage locations prior to the time of analysis and for maintaining the proper environment with the storage necessary to prolong the storage life of prepackaged reagents.



Since the reagent storage chambers cannot be placed in direct communication with the reaction compartments, means external to the disposable test package are provided to withdraw the prepackaged reagent from its storage chamber and to transfer said reagent to one or more of the reaction compartments and/or another reagent storage chamber.

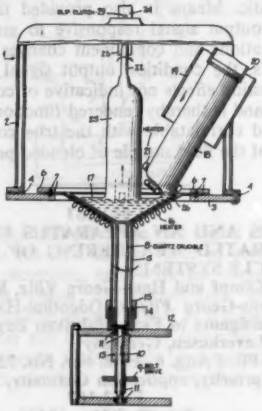
After incubation, each reaction compartment is utilized as a cuvette for optical analysis, without removal of the reaction mixture therefrom.

3,582,286
CRYSTALLIZER
Hozumi Tanaka, Ashiya-shi, Minoru Hanahusa, Takarazuka-shi, and Sadaji Kajihara and Yutaka Unno, Osaka-shi, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan
Filed July 21, 1967, Ser. No. 655,135
Claims priority, application Japan, July 23, 1966, 41/70,068
Int. Cl. B01d *9/02*
U.S. Cl. 23—273 **1 Claim**



Crystallizing ability of conventional crystallizer comprising a mixing barrel into which a solution of substance sought to be crystallized in the first solvent which is easily decomposable by the second solvent whose solvent power against said substance is relatively poor and said second solvent are concurrently fed, the slurry formed by said decomposition of said first solvent is continuously discharged, is much improved by the provision of an agitator having an impeller of maximum agitation at the proximity of the level of the liquid inside said mixing barrel.

3,582,287
SEED PULLING APPARATUS HAVING DIAGONAL FEED AND GAS DOPING
Emil R. Capita, 7020 Kennedy Blvd., North Bergen, N.J. 07047
Filed Jan. 9, 1968, Ser. No. 696,521
Int. Cl. B01j *17/18*
U.S. Cl. 23—273 **6 Claims**

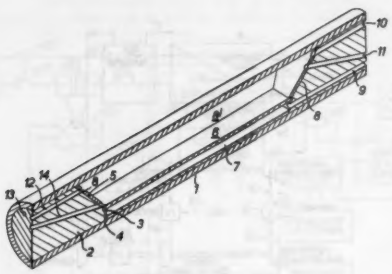


A means and method of producing a large diameter single crystal rod of semi-conductor material by the "seed-pulling" method comprising a hermetically-sealed chamber with means for introducing a bar of poly crystal material therein at an angle to the vertical so that a generally conical induction heating coil may be placed about the bar end within the chamber to heat it to a molten state; a rotating funnel-shaped receptacle located beneath the bar end for receiving the melted material flowing therefrom through a space between the heating coils; another conical heating coil for maintaining the melted material in the receptacle in a molten state so that a single crystal seed may be inserted into the melt to pull a single crystal rod therefrom. By feeding the poly crystal material to the melt at a predetermined rate while the rotating single crystal seed is being retracted at a predetermined rate a single crystal rod of any desired diameter may be produced, while requiring less heat input for producing and maintaining a melt than in prior devices of this type by virtue of the arrangement of the heating coils.

3,582,288
CHEMICAL REACTOR VESSELS
Royston Frank Taylor, Reading, and Thomas Rhys Jenkins, East Hendred, England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed May 8, 1968, Ser. No. 727,495
Claims priority, application Great Britain, May 11, 1967, 22,041/67
Int. Cl. B01j *1/00, 9/18;* **F26b** *17/10*
U.S. Cl. 23—284 **3 Claims**

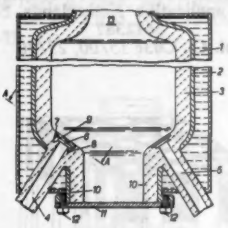
A gas/solids reactor vessel in the form of a horizontal trough with a porous base plate through which is a gas flow. The vessel is vibrated normal to the base plate and solids introduced at one end move along the trough and

out over a weir at the other end. A purge gas flows transversely across the top surface of the solids within



the vessel, the inlet and outlet for the purge gas being adjacent opposite ends of the trough.

3,582,289
CATALYTIC REACTORS
Albert Walter Elmes, Norton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Dec. 2, 1968, Ser. No. 780,478
Claims priority, application Great Britain, Dec. 8, 1967, 55,966/67
Int. Cl. B01j *9/04*
U.S. Cl. 23—288R **6 Claims**



A chemical reactor has its catalyst discharge at the bottom with a gas port at the top and circumferential gas ports at the bottom of the reactor but above the catalyst discharge. Preferably the reactor has an inner refractory lining and outer cooling jacket and gas ports made up of a circumferential channel in the refractory lining at the bottom of the reactor, provided with means to introduce or remove a gas at one or more points. This channel is covered by a gas permeable cover.

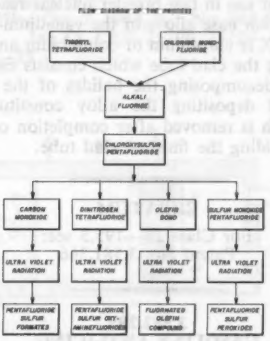
3,582,290
METAL EXTRACTION PROCESS
Robert R. Grinstead, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 553,698, May 31, 1966. This application Apr. 15, 1968, Ser. No. 721,192
Int. Cl. B01d *11/00;* **C22b** *59/00, 61/04*
U.S. Cl. 23—340 **12 Claims**

A novel process for stripping metal cations from an organic extract containing such ions in association with anions of an organic acid extractant for metal cations and having in admixture therewith a substantially aqueous insoluble amine wherein the pH of the extract before carrying out the stripping operation is such that the amine is in its free base form. The metal ions are stripped from the extract with weaker acids than are conventionally used by contacting the extract with an acidic system of an acidity such that the amine is converted to its protonated form, i.e. to a substituted ammonium ion, whereupon the metal ions are ejected from the organic extract into the stripping media by the resulting substituted ammonium ions.

3,582,291
SOLID IONIC CONDUCTORS
Geoffrey W. Mellors, Strongsville, Ohio, assignor to Union Carbide Corporation, New York, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 805,002, Mar. 6, 1969. This application Feb. 4, 1970, Ser. No. 8,709
Int. Cl. C01c *3/10*
U.S. Cl. 23—359 **5 Claims**

Novel compounds which are solid ionic conductors at room temperature are disclosed. These compounds conform to the general formula MCN·4AgI or modifications thereof wherein M is potassium, rubidium, cesium or mixtures thereof.

3,582,292
CHLOROXYSULFURPENTAFLUORIDE AND DERIVATIVES THEREOF
Carl J. Schack, Chatsworth, and Richard D. Wilson, Canoga Park, Calif., assignors to North American Rockwell Corporation
Filed Sept. 27, 1968, Ser. No. 763,141
Int. Cl. C01b *17/45;* **C07c** *161/00*
U.S. Cl. 23—367 **3 Claims**



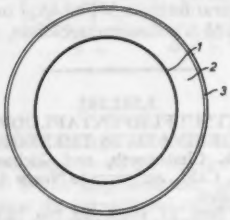
The compounds chloroxysulfurpentafluoride and pentafluorosulfur chloroformate are provided. These compounds are useful as polymerization initiators for fluoroolefins. A method is also provided for preparing chloroxysulfurpentafluoride by reacting thionyl tetrafluoride and chlorine monofluoride in the presence of potassium fluoride, rubidium fluoride, or cesium fluoride. The compounds pentafluorosulfurchloroformate, pentafluorosulfuroxydifluoramine and pentafluorosulfurperoxide are prepared by reacting chloroxysulfurpentafluoride with carbon monoxide, dinitrogen tetrafluoride and sulfur monoxide pentafluoride, respectively.

3,582,293
PREPARATION OF THIOPHOSPHORYL HALIDES
Joseph D. Odenweller, Bloomfield Hills, Mich., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Sept. 8, 1967, Ser. No. 666,508
Int. Cl. C01b *25/10*
U.S. Cl. 23—368 **16 Claims**

Alkylphosphonothioic dichloride-aluminum trihalide complexes, which can be produced by reacting thiophos-

phoryl halide with an alkyl aluminum sesquihalide or trialkyl aluminum, catalyze the formation of thiophosphoryl halide from sulfur and phosphorus trihalide.

3,582,294
CLADDED VANADIUM BASE ALLOY FOR NUCLEAR REACTOR
Roger Pierre Theisen, Luxembourg, Luxembourg, assignor to La Continentale Societe Anonyme, Luxembourg
Filed Jan. 3, 1968, Ser. No. 695,395
Claims priority, application Luxembourg, June 9, 1967, 53,851
Int. Cl. B32b *15/00*
U.S. Cl. 29—183.5 **5 Claims**



Clad tubes for metal and ceramic nuclear reactor fuels, particularly for use in fast breeder nuclear reactors, comprising vanadium base alloys of the vanadium-titanium-X type wherein X is chromium or columbium and the process of forming the clad tube which consists essentially of pyrolytically decomposing the halides of the alloy constitutents and depositing the alloy constituents on a mandrel which is removed after completion of the process, thus providing the finished clad tube.

ERRATUM

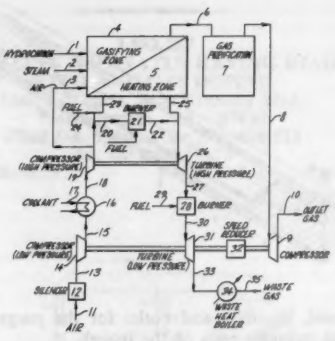
For Class 29—195.5 see:
Patent No. 3,581,366

3,582,295
GASOLINE ANTI-ICING
Lawrence J. Balash, Southfield, Mich., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Apr. 7, 1967, Ser. No. 629,086
Int. Cl. C10l *1/28*
U.S. Cl. 44—63 **8 Claims**

Gasoline containing, as an improved anti-icing additive, the combination of a substituted imidazoline, an amide or mixtures thereof and an organic silicon compound. Examples of the imidazoline and amide are 1-(2-hydroxyethyl)-2-heptadecenyl imidazoline and N(2-aminoethyl) - N - (2-hydroxyethyl)-oleylamide. Examples of suitable organic silicon compounds are polyhydrocarbylsiloxanes and alkyl silicates.

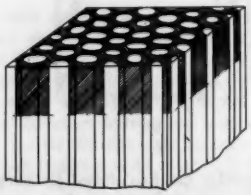
3,582,296
GASIFYING PROCESS
Shuji Umano, Kanagawa-ken, and Koh Nakasugi and Yoshihisa Imai, Tokyo, Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan
Filed July 5, 1968, Ser. No. 742,850
Claims priority, application Japan, July 15, 1967, 42/45,562
Int. Cl. C01b *2/14*
U.S. Cl. 48—215 **8 Claims**

A process for producing from hydrocarbons a hydrogen-containing gas in which a mixture of hydrocarbons and a gasifying agent is fed into a furnace where it is heated by a high temperature combustion gas and the



combustion gas is then fed to at least one turbine to recover useful energy.

3,582,297
METHOD OF MANUFACTURING A FIBER-OPTICAL ELEMENT
Henricus Theophile Petrus Franciscus Lakeman, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 28, 1967, Ser. No. 663,782
Claims priority, application Netherlands, Sept. 2, 1966, 6612387
Int. Cl. C03c *15/00, 23/20*
U.S. Cl. 65—4 **4 Claims**

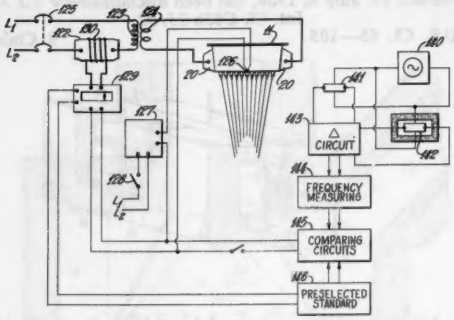


In the method of manufacturing a fiber-optical element in which a rod-shaped glass body having a high refractive index and containing a small quantity of monovalent ions surrounded by a glass sheath of low refractive index after being drawn into glass fibers which are assembled into a body which is again drawn to reduce its size and the fibers fused into a compact stack with minimum deformation, the monovalent ions are exchanged for other ions which increase the light absorption by the sheath.

3,582,298
FREQUENCY MEASURING APPARATUS FOR CONTROLLING THE TEMPERATURE OF A GLASS FIBER FORMING APPARATUS
William C. Trethewey, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation
Original application Nov. 3, 1966, Ser. No. 591,906, now Patent No. 3,467,325, dated Sept. 16, 1969. Divided and this application Apr. 7, 1969, Ser. No. 832,528
Int. Cl. C03b *37/02*
U.S. Cl. 65—11 **3 Claims**

This invention relates to an apparatus for issuing streams of molten glass to be attenuated into fibers. The temperature of the molten glass is sensed by a device generating a frequency signal which varies in proportion to

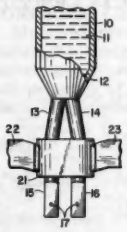
temperature variation of the molten glass. A known period of the cyclic variation of the frequency signal is selected and a counter counts a predetermined higher frequency rate during the known period to provide a measure of the temperature of the glass. The amount of heat supplied to the glass is controlled in response to the output of the counter.



3,582,299
MULTIPLE DELIVERY TIP FOR LIQUID GLASS

Robert T. Gladwell, Jr., 737 Cayuga Drive, R.D. 1, Horseheads, N.Y. 14845

Filed Nov. 6, 1967, Ser. No. 680,753
Int. Cl. C03b *5/26, 25/00*
U.S. Cl. 65—12 2 Claims



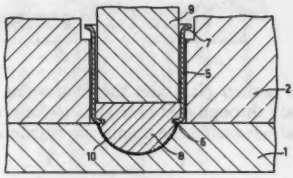
A multiple delivery tip glass feeder for use in an apparatus for forming low viscosity, high surface tension, readily devitrifiable molten glass into ribbon. The multiple delivery tubes are provided with heating means since the tips thereof must be positioned extremely close to the bite of the cooled forming rollers.

3,582,300
METHOD OF MANUFACTURING SEMICONDUCTOR CONTAINERS

Christopher Robert Combes, Bartley, and Geoffrey William Scholes, Eastleigh, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 28, 1968, Ser. No. 740,926
Claims priority, application Great Britain, July 25, 1967, 34,170/67
Int. Cl. C03c *27/02*
U.S. Cl. 65—31 5 Claims

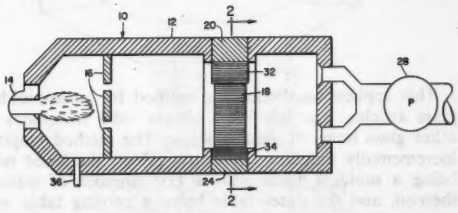
This method of manufacturing a semiconductor container which is comprised of a cylindrical metal can having a glass window at one end involves the steps of placing a solid glass preform in an open ended metal can and causing the solid glass preform to become molten glass by placing the metal can in a heated atmosphere. The can with the solid glass preform is placed in a mould jig in which the jig has a lens formed cavity at its base so that when the glass becomes molten it will flow into the cavity to form the proper window. After the combination is cooled a hermetic seal is established between the glass and the metal can. Subsequently the glass window is reheated to a temperature above the softening temperature of glass and below the working temperature so that it may become thermally polished.



3,582,301
METHOD FOR FORMING GLASS-CERAMIC HONEYCOMB STRUCTURES

Carl D. Andrysiak, Painted Post, Robert G. Foster, Elmira, Gerald A. Levine, Corning, and Max R. Montierth, Big Flats, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 7, 1968, Ser. No. 765,466
Int. Cl. C03b *29/00, 23/20*
U.S. Cl. 65—33 15 Claims



A method for forming honeycomb structures in which a plurality of multichanneled glass tubes are stacked together and heated to fuse the tubes together and partially to devitrify the tubes to form a semicrystalline body. The tubes are pressed together, while heating is effected by means of a hot gas which is passed through the channels in the tubes by a pressure differential which is maintained on opposite sides of the honeycomb structure.

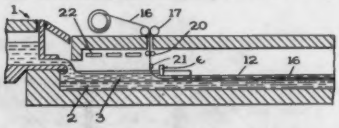
3,582,302
PROCESS AND APPARATUS FOR CONTINUOUS MANUFACTURE OF REINFORCED GLASS RIBBON

Hideo Kita and Yoshiaki Miwa, Maizuru-shi, Kyoto-fu, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Sept. 4, 1968, Ser. No. 757,392
Claims priority, application Japan, Sept. 11, 1967, 42/58,291
Int. Cl. C03b *13/10, 18/00*
U.S. Cl. 65—51 7 Claims

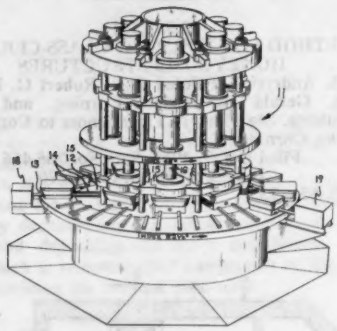
Reinforced glass ribbon manufactured by feeding molten glass onto a bath of molten metal under a non-oxidizing atmosphere, forming a pool of the molten glass by

restricting its free flow on the bath by means of a dam disposed across the bath with a slight clearance between its bottom and the upper surface of the bath, introducing a reinforcing material into the pool from above, drawing



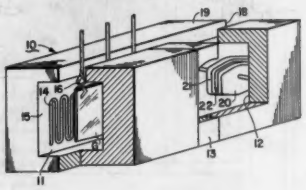
out the molten glass and the reinforcing material simultaneously through said clearance to form a composite ribbon and advancing the composite ribbon over the bath. face.

3,582,303
ROTARY PRESS-MOLDING METHOD FOR GLASS ARTICLES
William A. Stutske, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Sept. 16, 1968, Ser. No. 760,038
Int. Cl. C03b *9/18*
U.S. Cl. 65—72 **11 Claims**



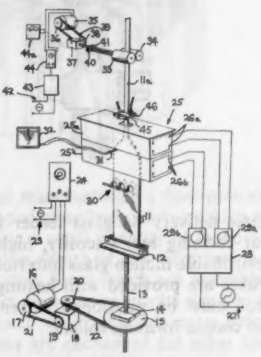
This application discloses a method for press-molding glass articles, e.g. television picture tube faceplates or other glass items of similar shape. The method employs incrementally indexing concentric tables, the inner table being a molding table with a first number of stations thereon, and the outer table being a cooling table with a second number of stations thereon. An article to be press-molded is advanced with the molding table, in unison with a movable mold which is located at one of the stations thereof and an aligned reciprocatable plunger in molding contact therewith, for a number of incremental steps of the table which is pre-selected to provide sufficient time for proper pressing of the article. After the predetermined number of incremental steps, the plunger is retracted and the mold and article therein are shifted, in unison, to a station on the cooling table, for incremental advancement therewith until the article has had sufficient time, at the rotational cycle time of the cooling table, to cool to a temperature adequate for removal from the mold. Thereupon the article is removed from the mold, a fresh gob of glass to be molded is added to the mold, and the mold is moved back to a station on the molding table to begin a repeat of the cycle. In the meanwhile, the same cycle has been initiated with a number of other molds. For a given number of inner table stations and a given number of outer table stations, articles may be molded with great flexibility as to production rate, pressing time and cooling time by varying the number of molds employed, the relative locations of the mold transfer positions, and the relative rotational directions of the indexing movements of the molding and cooling tables.

3,582,304
FORMING ARTICLES FROM SHEET GLASS
Lewis L. Bognar, 410 Beartown Road, Painted Post, N.Y. 14870
Filed Oct. 5, 1967, Ser. No. 673,123
The portion of the term of the patent subsequent to July 8, 1986, has been disclaimed
Int. Cl. C03b *23/02*
U.S. Cl. 65—105 **9 Claims**



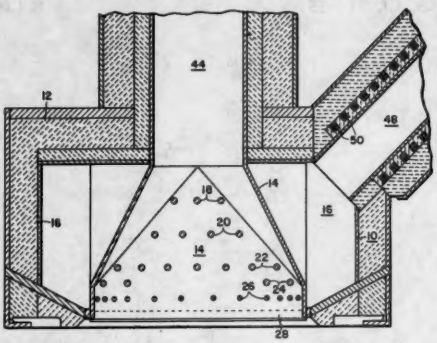
Intricate articles are formed from sheet glass by rapidly heating the sheet above its softening temperature while suspended in a vertical plane from above, and quickly press-forming an article before detrimental attenuation occurs with forming members heated to about the annealing temperature of the glass, so as to form an article having a wall thickness substantially the same as the thickness of the original glass sheet.

3,582,305
METHOD AND APPARATUS FOR THE MANUFACTURE OF A CONTOURED REDRAWN GLASS ARTICLE
Glenn H. Dunlap, Maumee, and Anthony M. Kobylak, Rossford, Ohio, assignors to Owens-Illinois, Inc.
Filed June 3, 1968, Ser. No. 734,011
Int. Cl. C03b *23/02*
U.S. Cl. 65—106 **10 Claims**



This application discloses apparatus and method for the manufacture of a redrawn vitreous or glass article, viz an article of substantially greater length and substantially reduced cross-sectional area than the original article, in which the redrawn article is provided with a cross-sectional contour which is different from that of the original article. Contouring is accomplished by providing a pair of die members having opposed, complementary contoured article-contacting surfaces which the article passes between and in contact therewith along its path of travel after the article has cooled to a self-sustaining temperature following the longitudinal elongation and cross-sectional contraction of the article in a high temperature attenuation zone.

3,582,306
GLASS FEEDERS
James W. Giffen, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Nov. 4, 1968, Ser. No. 773,173
Int. Cl. C03b 17/00
U.S. Cl. 65—121 11 Claims



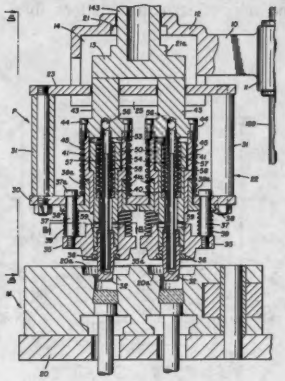
A feeder construction having a central glass delivery container surrounded by an outer glass delivery chamber which are in communication along a delivery passage at their lower extents, is provided for forming stratified or composite sheets or ribbons of vitreous material within a confined space directly from separate supplies of molten glass.

3,582,307
METHOD OF REMOVING WATER FROM MELTS OF INORGANIC GLASS
Hans-Otto Mulfinger, Mainz-Mombach, Germany, and Helmut Franz, Oakmond, Pa., assignors to Max-Planck-Institut fur Silikatforschung, Wurzburg, Germany
No Drawing. Continuation-in-part of application Ser. No. 603,433, Dec. 21, 1966. This application Jan. 19, 1970, Ser. No. 4,045
Claims priority, application Germany, Dec. 24, 1965, M 67,797
Int. Cl. C03b 5/16
U.S. Cl. 65—134 3 Claims

Water is removed from a melt of inorganic glass by introducing into the glass melt molecular nitrogen with a nitrogen-free reducing agent, such as carbon or carbon monoxide which with the glass-forming elements carrying oxygen and hydroxyl groups form volatile compounds other than water, and a nitrogen-containing agent such as nitrides or atomic nitrogen. Thereby the oxide atoms and hydroxyl groups bound to the glass-forming elements are replaced by nitrogen atoms. The reducing agents may be added to the glass batch prior to or during the melting process.

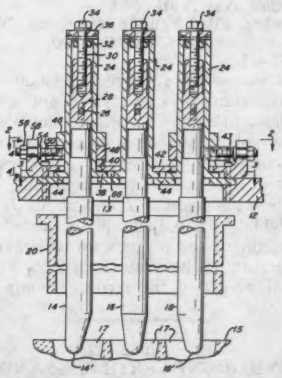
3,582,308
GLASS PRESSING PLUNGER ASSEMBLY
John W. Eldred, Columbus, Ohio, assignor to The Eldred Company, Columbus, Ohio
Filed Jan. 6, 1969, Ser. No. 789,289
Int. Cl. C03b 11/06
U.S. Cl. 65—318 7 Claims

A glass pressing plunger assembly for use in connection with a mold on a movable mold table which is provided with means for readily mounting it on a suitable support or permitting removal therefrom. Also, it is provided with means permitting self-centering thereof relative to the mold with which it cooperates. In addition, it is provided with a dual pressure arrangement whereby sufficient pressure is first applied to press the glass charge in the mold and then a reduced pressure is employed thereafter to merely maintain the plunger in contact with the



formed glass blank to extract the heat therefrom and set the glass, after which the plunger is completely removed from the mold to permit removal of the blank.

3,582,309
TRIPLE GOB FEEDER HAVING ADJUSTABLE PLUNGERS
Robert S. Bracken, Vineland, N.J., assignor to Maul Bros. Inc., Millville, N.J.
Continuation of abandoned application Ser. No. 660,474, Aug. 14, 1967. This application Mar. 16, 1970, Ser. No. 18,790
Int. Cl. C03b 7/00
U.S. Cl. 65—328 6 Claims

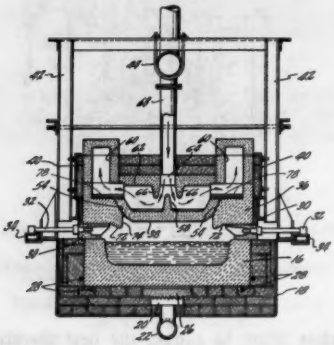


Feeder for molten glass is provided with three aligned plungers of which the two outside ones are adjustable in directions perpendicular to the longitudinal axis of the plungers.

3,582,310
MOLTEN GLASS FOREHEARTH CONSTRUCTION
Charles R. Avery, Chester, and John H. Call, Tariffville, Conn., assignors to Emhart Corporation, Bloomfield, Conn.
Filed Nov. 4, 1968, Ser. No. 773,024
Int. Cl. C03b 5/16
U.S. Cl. 65—346 7 Claims

The forehearth has a channel through which molten glass flows toward a feeder bowl located at the downstream end thereof. The channel structure is cooled along

its central portion by air circulated through a longitudinally extending passageway defined along the center line of the channel structure. A plurality of burners fire laterally into the space above the molten glass in the channel, and a roof structure defines flues for carrying



off the exhaust gasses. The roof structure has internally cooled arch or keystone blocks which define individual chambers through which cooling air can be circulated independently of the exhaust gas flues to cool the center portion of the roof structure, and consequently reduce transverse temperature gradients in the forehearth.

3,582,311

METHOD FOR PRODUCING AQUEOUS SUSPENSION FERTILIZERS

Lawrence E. Browder, Colonial Heights, and Harry E. Ulmer, Hopewell, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Feb. 16, 1968, Ser. No. 705,929
Int. Cl. C05b *7/00*
U.S. Cl. 71—1 **1 Claim**

Aqueous suspension fertilizers resistant to sedimentation and formation of large crystals and solid aggregates are formulated to comprise a water-soluble polyphosphate and a water-soluble magnesium compound. The ratio of the weight of the polyphosphate (expressed as P_2O_5) to the weight of the magnesium compound (expressed as MgO) is between about 0.2 and about 2, and the sum of the weight of the polyphosphate (expressed as P_2O_5) and the weight of the magnesium compound (expressed as MgO) constitutes between about 0.5% and about 12% of the total weight of the fertilizer composition.

3,582,312

MICRONUTRIENT FERTILIZER AND METHOD FOR ITS PREPARATION

Howard V. Hess, Glenham, and Edward L. Cole, Fishkill, N.Y. (both of Texaco Inc., P.O. Box 509, Beacon, N.Y. 12508)

No Drawing. Continuation-in-part of application Ser. No. 611,233, Jan. 24, 1967. This application Mar. 27, 1970, Ser. No. 23,501
Int. Cl. C05f *11/00*
U.S. Cl. 71—27 **7 Claims**

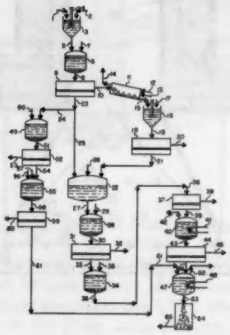
Process for preparing cation exchanged derivatives of sulfonated petroleum coke or the alkali metal salts thereof, useful as micronutrient fertilizer, soil conditioner, or as ion exchange material. Petroleum coke is sulfonated at a temperature in the range of about 150 to 250° F., washed, and contacted with dilute aqueous solutions containing a cation from the group consisting of copper, iron, magnesium, molybdenum, manganese, zinc, cobalt, ammonium and mixtures thereof.

3,582,313

PRODUCTION OF NITROPHOSPHATE FERTILIZER, AMMONIUM NITRATE, AND CALCIUM SULFATE OR CALCIUM CARBONATE

Samuel Strelzoff, New York, N.Y., and Sydney Atkin, Springfield, N.J., assignors to Chemical Construction Corporation, New York, N.Y.

Filed Oct. 9, 1968, Ser. No. 766,139
Int. Cl. C05b *11/06*
U.S. Cl. 71—35 **8 Claims**



Nitrophosphate fertilizer is produced by the nitric acid digestion of phosphate rock. The pH of the initial digestion solution is raised to the range of about 1.8 to 2.5 by ammonia addition, to precipitate impurities including a major portion of fluoride and iron phosphate. The solid precipiitate is filtered from the clear solution, and the solid filter cake is calcined at elevated temperature to volatilize fluoride and decompose iron phosphate into a nitric acid-insoluble form. The calcined cake is digested with nitric acid to recover phosphate and aluminum values in solution, and the resulting slurry is filtered and the solid filter cake containing iron compounds and silica is discarded. The clear filtrate is combined with the initial clear solution previously formed by filtration to remove solid fluoride and iron impurities, and the combined solution is preferably further acidified to reduce the pH to a low and highly acid value. A soluble salt such as ammonium sulfate or potassium sulfate, which has an anion which forms an insoluble solid salt with the calcium cation, is added to the combined solution, and an insoluble solid calcium salt is precipitated. Filtration removes the solid calcium salt, and ammonia is added to the remaining solution to raise the pH above 3.0 and precipitate remaining impurities. After removal of precipitated solid impurities by filtration, the final solution is processed by water removal to produce solid nitrophos fertilizer, usually together with ammonium nitrate as a co-product.

3,582,314

METHOD FOR KILLING GRASSY AND BROADLEAF WEEDS

Makoto Konnai, Horinouchi, Shizuoka Prefecture, and Hiroshi Kamata and Masaru Kado, Shimizu, Japan, assignors to Ihara Chemicals Company Limited, Shimizu, Japan

No Drawing. Continuation of application Ser. No. 651,148, July 5, 1967. This application Mar. 19, 1970, Ser. No. 19,546
Claims priority, application Japan, Feb. 10, 1967, 42/8,153; Mar. 27, 1967, 42/18,774
Int. Cl. A01n *9/00*
U.S. Cl. 71—88 **9 Claims**

A herbicidal composition comprising as an active ingredient a thiocarbamate compound of the formula

$$R-\overset{\overset{O}{\|}}{C}-S-CH_2-R'$$

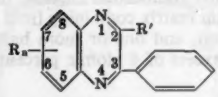
in which R is selected from group consisting of monoalkylaminodialkylamino, piperidino and morpholino radical and R' is a halogenated phenyl.

3,582,315
METHODS AND COMPOSITIONS FOR INHIBITING PLANT GROWTH

Quentin Francis Soper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

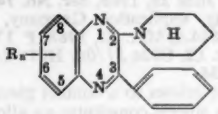
No Drawing. Filed Mar. 22, 1968, Ser. No. 715,144
Int. Cl. A01n *9/22*
U.S. Cl. 71—92 **10 Claims**

The present invention is concerned with methods and compositions useful in inhibiting the growth of plants, and is particularly directed to methods employing and compositions comprising an active agent which is a compound of the formula



or its acid addition salts, wherein R represents halo or methyl, said R being located on the 6 or 7 position, only; R' represents halo, hydroxy, loweralkoxy, amino, n-loweralkylamino, di-n-loweralkylamino, or piperidino; and *n* represents an integer of from 0 to 1, both inclusive.

The present invention is also directed to the novel compound of the formula

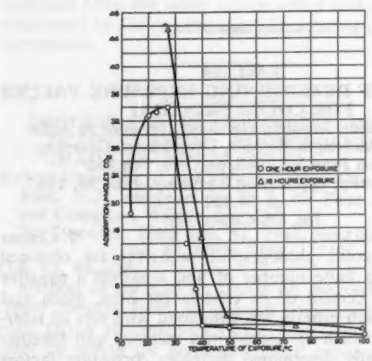


and its acid addition salts, wherein R, as above, represents halo or methyl, said R being located on the 6 or 7 position, only, and *n* represents an integer of from 0 to 1, both inclusive.

3,582,316
PROCESS FOR STORING PARTIALLY OXIDIZED LEAD POWDERS

George A. Parker, Cheswick, and Robert S. Bowman, Pittsburgh, Pa., assignors to St. Joseph Lead Company, New York, N.Y.

Filed May 3, 1968, Ser. No. 726,410
Int. Cl. B22f *3/02, 3/10*
U.S. Cl. 75—.5A **3 Claims**



The adsorption of carbon dioxide by partially oxidized lead power during storage and handling in air is minimized by maintaining the powder at a temperature above 50° C.

3,582,317
BENEFICIATION OF OXIDIZED OR WEATHERED SULFIDE ORES

Tatsuichi Gamo, 111–6 Mitsuzaki, Totsuka-ku, Yakahama-shi, Kanagawa-ken, Japan, and Takeshi Furukawa, 958, 1–5, Hoshino-mura, Hayame-gun, Fukuoka-ken, Japan

Filed Dec. 20, 1968, Ser. No. 785,579
Claims priority, application Japan, Dec. 20, 1967, 42/81,141
Int. Cl. C21b *1/08;* **C22b** *15/08, 19/22*
U.S. Cl. 75—2 **7 Claims**

The beneficiation according to the present invention is carried out by comminuting the starting complex sulfide ore (including so-called black ore), while being concurrently air-dried, the comminuted dry ore is then forthwith pulped, and the pulp is subjected to leaching with e.g. water to leach out water-soluble constituents therefrom. Filtration separates the water-insolubles from the filtrate. Rough flotation separates the filter cake into a pyrite concentrate and a copper and zinc concentrate. The latter is separated into a copper concentrate and a zinc concentrate by differential flotation, following conditioning. Cyanide solubles are removed from the zinc concentrate. Wash waters and filtrates from the leachings are recirculated and re-used.

3,582,318
HEAT-RESISTANT CRACK-RESISTANT DUCTILE STEEL WELD DEPOSIT

Edwin R. Szumachowski, Springettsbury Township, York County, Pa., assignor to The McKay Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 445,728, Apr. 5, 1965. This application Sept. 5, 1967, Ser. No. 665,304
Int. Cl. C22c *39/26*
U.S. Cl. 75—122 **2 Claims**

A heat-resistant high silicon chromium-nickel austenitic steel weld deposit possessed of good ductility and superior crack resistance consisting essentially of the following composition:

	Percent
Carbon	0.4 maximum
Manganese	2.5 to 9.0
Silicon	0.50 to 1.20
Chromium	14.0 to 30.0
Nickel	28.0 to 50.0
Iron	12.0 minimum
Molybdenum	0 to 4.0

Manganese equivalent (percent Mn+20 x percent C+.25 x percent Mo—4 x percent Si)—4.7 minimum.

3,582,319
A1 ALLOY USEFUL AS ANODE AND METHOD OF MAKING SAME

John T. Reding, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

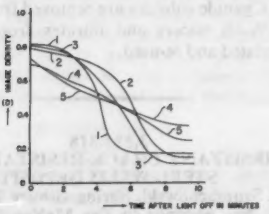
No Drawing. Filed Oct. 2, 1969, Ser. No. 863,329
Int. Cl. C22c *21/00*
U.S. Cl. 75—141 **2 Claims**

An aluminum alloy containing 0.02 to 0.2 wt. percent Hg, 0.1 to 20 wt. percent Zn and 80 to 200 parts per million Cu, useful as a sacrificial galvanic anode in low resistance environments. The small amounts of Cu result in increased anode life.

3,582,320
COBALT BASE ALLOY
Robert B. Herchenroeder, 609 N. Korby, Kokomo, Ind. 46901
No Drawing. Filed Dec. 22, 1969, Ser. No. 887,376
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 3 Claims

A cobalt base alloy having superior oxidation and wear resistance which has a relatively high carbon content and contains a minor proportion of lanthanum.

3,582,321
ELECTROPHOTOGRAPHIC BINDER PLATES MADE FROM MIXTURES OF WATER SOLUBLE RESINS
Yasuo Ueda, 3–32 Kitano-cho, Ikuta-ku, Kobe, Hyogo Prefecture, Japan; Akira Takatsu, 3–5–16 Kusatsu-cho, Kusatsu, Siga Prefecture, Japan; and Tatsuo Aizawa, 6–34 Kuwazu-cho, Higashisumiyoshi-ku, Osaka, Japan
Filed Nov. 13, 1967, Ser. No. 682,078
Claims priority, application Japan, Nov. 25, 1966, 41/77,664
Int. Cl. G03g *13/22, 5/08*
U.S. Cl. 96—1.8 4 Claims



An electrophotographic plate for use in chargeless electrostatic printing and the method of making the same in which a base material is coated with a mixture of water soluble resins such as polyvinyl acetate emulsion and polyvinyl acetal with a photoconductor such as microcrystalline zinc oxide ground together in a ball mill with the addition of some organic acid and the coating applied to a suitable thickness so that the completed electrophotographic plate will have a memory effect and will hold a latent image of light for a limited period of time which is sufficient to provide for development to produce a contrasting image of satisfactory density and the coating can be done in the light and the electrophotographic plates can be made ready for use by being placed in the dark for a short period of time without requiring complicated procedures.

3,582,322
COLOR PHOTOGRAPHIC ELEMENTS AND PROCESS
Charles O. Edens and John H. Van Campen, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed June 11, 1968, Ser. No. 736,010
Int. Cl. G03c *7/16*
U.S. Cl. 96—22 21 Claims

Color photographic elements containing differently sensitized silver halide emulsions, a nondiffusible yellow dye-forming coupler that reacts with an oxidized primary aromatic amine color developing agent to form a yellow dye and substantially no uncolored form of the yellow dye, a 5-pyrazolone coupler, a cyan dye-forming coupler and hydrophilic colloids that are substantially free of aldehyde hardening agents and substantially free of aldehyde-releasing hardening agents are advantageously color processed by color development step followed by a blix step to produce good dye image densities with substantially no uncolored forms of the dyes being present.

3,582,323
ALUMINUM-IRON ALLOY FOR EXHAUST VALVES OF INTERNAL COMBUSTION ENGINES
John C. Sawyer and Charles F. Barth, Cleveland, Ohio, assignors to TRW Inc., Cleveland, Ohio
No Drawing. Filed Nov. 17, 1967, Ser. No. 683,816
Int. Cl. C22c *37/10*
U.S. Cl. 75—124 1 Claim

Iron-aluminum alloys particularly useful in exhaust valves for internal combustion engines, the alloys having an iron-aluminum matrix containing from 30 to 50 atomic percent aluminum, and one or more hardening elements totaling not in excess of 6 atomic percent.

3,582,324
CONTACT PIECE FOR A SEMICONDUCTOR
Alfred Kunert, Nuremberg, Eugen Szabo de Bucs, Erlangen, and Gerhard Oesterhelt, Nuremberg, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed June 28, 1968, Ser. No. 741,078
Claims priority, application Germany, July 1, 1967, P 15 58 644.4; Mar. 23, 1968, P 17 58 044.8
Int. Cl. C22c *31/00;* H01v *1/16*
U.S. Cl. 75—134 59 Claims

The invention relates to a contact piece for a semiconductor, wherein silicon constitutes an alloying component of the semiconductor and of the contact piece, and to a method of its production. The contact piece is primarily used for contacting semiconductor bodies in thermoelectric devices, particularly thermogenerators and has the general composition:

$$(Me^{I}_{y}\ Me^{II}_{1-y})_{x}\ Si_{1-x}$$

wherein $0.5 \leqslant y \leqslant 0.9$ and $0.05 \leqslant x \leqslant 0.35$ and Me^{I} and Me^{II} are each a metal of the IV, V, VI, VII or VIII secondary groups of the periodic table with the exception of technetium.

ERRATA

For Classes 96—1.8 and 96—22 see:
Patent Nos. 3,582,321 and 3,582,322

3,582,325
METHOD OF DETERMINING EXPOSURE VALUES FOR COLOR PRINTING
Rudolf Paulus, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed June 26, 1968, Ser. No. 740,262
Claims priority, application Germany, June 30, 1967, A 56,131
Int. Cl. G03c *7/16*
U.S. Cl. 96—23 7 Claims

Prints of color photographic negatives are obtained by scanning a finite number of unit areas on a negative to determine certain of its criteria for blue, green and red colors. Such criteria are compared with sets of reference criteria which are stored in a memory unit together with empirically determined optimum correction factors for each set of reference criteria. The comparison is made for the purpose of locating or selecting those correction factors which are best suited for adjustment of the exposure control in an automatic printer. The thus ob-

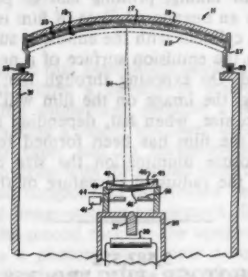
tained information is fed to the exposure control not later than when the freshly scanned negative enters the printing station.

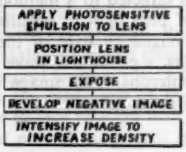
3,582,326

PHOTOGRAPHIC PROCESS FOR FORMING A LIGHT INTENSITY CORRECTING FILTER USED IN EXPOSING A COLOR CRT SCREEN

Harry E. Smithgall, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.

Original application Oct. 18, 1963, Ser. No. 317,352, now Patent No. 3,448,667. Divided and this application Sept. 27, 1968, Ser. No. 763,214
Int. Cl. G03c 5/04
U.S. Cl. 96—27 6 Claims





A photographic process for forming light attenuation means on an optical component positioned in an optical system used for exposing a color CRT screen, said component being positioned intermediate a light source and said screen. The desired attenuation characteristics are formed by exposing and developing a photographic emulsion coated on said component, the exposure being made using radiation from the same source which will eventually be attenuated by the resultant metallic coating on the optical component.

3,582,327

PROCESS FOR TRANSFERRING PARTICLE IMAGES FROM PHOTOPOLYMERIZED IMAGE-BEARING LAYERS

Robert Henry Boyd and Victor Fu-Hua Chu, East Brunswick, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 31, 1968, Ser. No. 701,857
Int. Cl. G03c 7/16, 11/12
U.S. Cl. 96—28 8 Claims

Method of forming an image on the surface of a receptor element from an element comprising (a) a support, (b) a photopolymerizable layer, and (c) a cover sheet by giving the layer an overall exposure to actinic radiation, before or after an imagewise exposure, sufficient to form an addition polymer but insufficient to completely polymerize the layer, exposing the layer to actinic light to form an addition polymer image in said layer, removing the cover sheet, applying finely divided pigment particles to the non-exposed image areas, placing the layer in contact with a receptor surface, and applying heat and pressure and removing the receptor element while still hot. The resulting image is dry, has no appreciable relief, and has a matte, ink like appearance.

3,582,328

PLANOGRAPHIC PRINTING PLATE FROM MERCURIC ION ON SILVER DIFFUSION TRANSFERRED IMAGE

Louis Maria De Haes, Edegem, Johannes Josephus Vanheertum, Zandhoven, and Hugo Karel Gevers, Edegem, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Jan. 11, 1968, Ser. No. 697,028
Claims priority, application Great Britain, Jan. 11, 1967, 1,488/67
Int. Cl. G03c 5/54
U.S. Cl. 96—29 9 Claims

A planographic printing plate is prepared from sheet material carrying an outer hydrophilic colloid layer thereon by creating a pattern of finely divided silver particles disposed essentially at the surface of the colloid layer and treating the colloid layer with an aqueous composition containing mercury(II) ions in a sufficient concentration of about 5–50 gms. per liter to render the pattern of silver particles receptive to a hydrophobic ink. If not already hardened, the colloid layer should be hardened prior to printing in any conventional way in order to preclude transfer of colloid material from the layer during printing. The pattern of finely divided silver particles at the surface of the layer is preferably produced by means of the known silver complex diffusion transfer process, and the colloid layer can contain one or more substances often referred to as development nuclei for promoting the deposition on the surface thereof of metallic silver particles from the diffusing complexed silver halide, or such substances can be supplied to the layer in other ways, such as via the development bath.

3,582,329

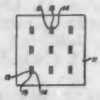
METHOD OF MAKING LENTICULAR SCREENS

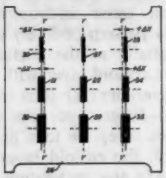
Semen Pavlovich Ivanov, Moscow, and Ljudmila Vladimirovna Akimakina, Moskovskaja Obl., U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Kinofotoinstitut, Moscow, U.S.S.R.

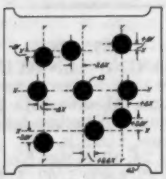
Filed May 25, 1965, Ser. No. 458,530
Int. Cl. G03f 5/02, 5/12
U.S. Cl. 96—35 6 Claims

A method of manufacturing a high-quality lenticular screen of preset cross-section and having an opaque layer between the lens elements wherein a first transparent plate having a light-sensitized colloid layer is provided, which layer contacts a second transparent plate upon which the lenticular screen is to be made. A negative of a workpiece is printed on the light-sensitized layer by passing light from a light source of uniform intensity through an initial screen and the second transparent plate. This so formed negative of the workpiece is stained to form non-transparent areas in the places of the future lenses. The second transparent plate is coated with a light-sensitized colloid and the coated plate is matched with the stained negative of the workpiece on the first transparent plate. A positive image of the workpiece is printed on the coated second plate. The positive image of the workpiece is then stained to form non-transparent layers between the transparent areas for the lenses. The positive image of the workpiece is again coated with a light-sensitized colloid and microlenses are formed in the transparent areas by exposing the coated positive image of the workpiece to a source of light of uniform intensity through the initial screen.

3,582,330
METHOD AND APPARATUS FOR MAKING SEMICONDUCTOR DEVICES
Joseph Kocsis, Jefferson, N.J., assignor to Bell Telephone Laboratories, Incorporated, New York, N.Y.
Filed Dec. 9, 1964, Ser. No. 417,095
Int. Cl. G03c 5/00; B01j 17/00; H01l 5/00
U.S. Cl. 96—36.2 **8 Claims**







Masking apparatus and techniques are disclosed for the fabrication of objects such as high frequency semiconductor devices that have extremely closely spaced elements. For example, the invention can be used to position an elongated emitter electrode between two elongated base electrodes. In the space on a wafer ordinarily occupied by a single conventional transistor, a number of transistors are fabricated with photo-resist and masking. The mask used to define the emitter electrodes in such a case comprises an array of stripes. However, most of the stripes are slightly misaligned with respect to the corresponding pair of base electrodes or are slightly too large or too small. Thus, even if the mask is slightly misaligned, at least one of the misaligned stripes on the mask is found to be correctly aligned with the pair of base electrodes. And even if the photo-resist is slightly under-exposed or over-exposed, at least one of the different sized stripes compensates for it. Consequently, production of at least one good transistor is assured even if the mask is misaligned or the exposure time is other than optimum. And because the combined area of the good and bad transistors on the wafer is the same as the area of a conventional transistor, no part of the wafer is wasted.

3,582,331
PROCESS FOR MAKING A SMALL LINEAR CHANGE IN A PHOTOGRAPHIC IMAGE
Donald J. Howe, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 6, 1968, Ser. No. 726,758
Int. Cl. G03c 11/00
U.S. Cl. 96—46 **8 Claims**

A process for making a small, linear dimensional change in a photographic image to correct a change made in the course of taking, printing and/or processing the image in which an unexposed piece of film is formed into a segment of a cylinder with the emulsion surface thereof in contact with the emulsion surface of a negative that is to be corrected. On exposing through the negative and after processing, the image on the film will be increased or decreased in size, when flat, depending on the direction in which the film has been formed relative to the source of exposure illumination the size change being determined by the radius of curvature of the unexposed film.

3,582,332
PHOTOGRAPHIC PROCESS
Robert C. Bertelson and Kenneth D. Glanz, Kettering, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Feb. 1, 1966, Ser. No. 524,165
Int. Cl. G03c 5/24
U.S. Cl. 96—48 **4 Claims**

This disclosure is directed to a method of photography involving the use of blue light to sensitize a film thereby enabling it to be imaged by light of the visible red and infrared wavelengths, e.g., in the wave length range of 630 to 4200 millimicrons. This image can be fixed by washing with a non-polar solvent.

3,582,333
METHOD FOR REDUCING COLOR FOG IN COLOR EMULSIONS COATED ON ELECTRON BOMBARDED SUPPORTS
Richard G. Yost, Spencerport, and Ronald L. Heidke, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Apr. 8, 1968, Ser. No. 719,691
Int. Cl. G03c 1/76, 1/34
U.S. Cl. 96—74 **23 Claims**

Color fog formation and loss of speed in a color-former bearing emulsion layer coated nearest to a hydrophobic surface that is electron bombarded just prior to coating is advantageously reduced or prevented by the incorporation of a reducing agent in said emulsion layer, or in a nonlight-sensitive hydrophilic colloid layer coated between said emulsion layer and the electron bombarded support.

3,582,334
DIAZOTYPE PHOTOPRINTING MATERIALS
Luigi Amariti, Chicago, Ill., assignor to Eugene Dietzgen Co., Chicago, Ill.
No Drawing. Filed Nov. 7, 1968, Ser. No. 774,206
Int. Cl. G03c 1/52
U.S. Cl. 96—75 **5 Claims**

Diazotype photoprinting compositions containing 4,4' 4" - methylidynetris(N,N-dimethylaniline). In the present system 4,4',4" - methylidynetris(N,N - dimethylaniline) prevents finished prints from acquiring a yellowish appearance.

3,582,335

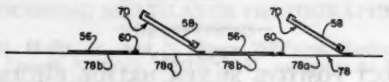
FILM UNIT HAVING SENSITIVE LAYER AND RECEIVING LAYER WITH COMMON WEB FOR FACE TO FACE CONTACT

Irving Erlichman, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of application Ser. No. 344,601, Feb. 13, 1964, which is a division of application Ser. No. 48,666, Aug. 10, 1960, now Patent No. 3,152,529. This application Feb. 21, 1967, Ser. No. 617,725

Int. Cl. G03c *1/48, 5/54;* G03b *10/10*

U.S. Cl. 96—76 11 Claims



A photographic film assemblage adapted to be exposed and processed within a camera to produce a transfer image. The film assemblage includes a carrier sheet, a second sheet having a length less than one-half the length of the carrier sheet and an image-containing element adapted to cooperate with the second sheet during processing by a liquid composition distributed between the second sheet and image-containing element. In one embodiment, either the second sheet or the image-containing element includes a photosensitive layer adapted to be exposed to form an image and the other includes an image-receptive layer for supporting a transfer image. The image-containing element is carried by the carrier sheet and the second sheet is mounted on the carrier sheet for pivotal movement through 180° relative to the carrier sheet and image-containing element about an axis substantially in the carrier sheet. The second sheet is initially positioned with respect to the carrier sheet such that one side of the second sheet faces the carrier sheet. Both the second sheet and the image-containing element initially are symetrically positioned with respect to the pivotal axis on opposite sides thereof such that the other side of the second sheet will be located in face-to-face relation with the image-containing element upon pivotal movement of the second sheet through 180° about the axis.

3,582,336

METHOD OF PREPARING OIL-MILK-SUGAR CLAD CEREAL PARTICLES AND THE RESULTING PRODUCT

Ben E. Rasmusson, 12510 SE. 62nd Place, Bellevue, Wash. 98004

No Drawing. Continuation-in-part of application Ser. No. 555,810, June 7, 1966. This application July 18, 1967, Ser. No. 654,058

Int. Cl. A23l *1/10*

U.S. Cl. 99—83 8 Claims

Prepared cereal particles clad with an oil-milk-sugar mix, wherein a proteinaceous constituent in the form of toasted, fried, and/or expanded cereal particles is enveloped or coated with a cladding constituent having a melting point in the range of from about 96° F. to about 110° F., which cladding constituent is at least principally comprised of substantial amounts of hard butter vegetable oil, milk solids, and sugar or a sugar substitute, and being applied to the cereal particles only superficially, the cereal particles thereby being in substantially non-crushed condition. Food products of the invention can comprise a relatively small amount of cladding constituent so as to leave the final product in flake or loose form in a manner characteristic of boxed breakfast cereals, or sufficient cladding constituent can be applied to render the product in fixed form, i.e. bar-like. Optionally, such food products can incorporate one or more additional ingredients such as an emulsifier, salt, flavoring, an antioxidant, vitamin and mineral additives, and the like. In general, the oil-milk-sugar cladding constituent imparts to the prepared cereal particles a sweet, cream-like taste when eaten, which is comparable to that of a breakfast-type prepared cereal to which both sugar and fluid milk have been added. This taste simulation results either when the food product is eaten in dry form, or with water added.

3,582,337

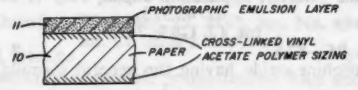
LIGHT-SENSITIVE PHOTOGRAPHIC PAPER

William H. Griggs, Rochester, Merle K. Eldridge, Hilton, and David R. Fulton, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 27, 1968, Ser. No. 740,581

Int. Cl. G03c *1/86*

U.S. Cl. 96—85 9 Claims



Photographic paper base is sized with a dispersion of cross-linked vinyl acetate polymer to avoid mottle, obtain improved stiffness and other properties.

3,582,338

FILM ELEMENTS AND PROCESS OF PREPARING SAME USING ELECTRON BOMBARDMENT

Richard G. Yost, Spencerport, and Irving S. Willison, Kodak Park, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 29, 1968, Ser. No. 748,190

Int. Cl. G03c *1/78;* C03c *1/00*

U.S. Cl. 96—87 16 Claims

Photographic elements are prepared by spectrally sensitizing a photographic silver halide emulsion with a cationic imidazolocyanine dye; incorporating a photographic color former in said emulsion; subjecting a hydrophobic surface to sufficient electron bombardment to provide good adhesion for said emulsion; and, coating said emulsion over the hydrophobic surface substantially immediately after electron bombardment. Photographic elements are provided comprising an electron bombarded hydrophobic support having coated thereon an emulsion spectrally sensitized with a cationic imidazolocyanine dye, and containing photographic color former.

3,582,339

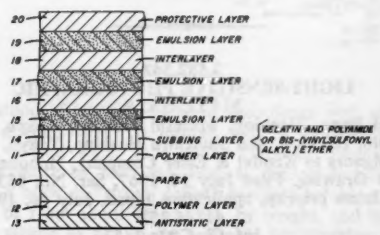
PHOTOGRAPHIC ELEMENT

Richard H. Martens, Francis M. Hartman, and William J. Venor, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1968, Ser. No. 771,764

Int. Cl. G03c *1/76, 1/30*

U.S. Cl. 96—87 8 Claims



The adhesion of photographic layers to corona activated polyolefin surfaces is improved by coating a gelatin subbing layer containing certain gelatin hardening agents onto

the corona activated surfaces. The fogging of silver halide emulsion layers coated on the corona activated surfaces is also avoided. The hardening agents include either (1) a water-dispersible polymeric reaction product of epichlorohydrin with a polyamide derived from a polyalkylene polyamine and a dicarboxylic acid or (2) a bis-vinylsulfonyl alkyl ether.

3,582,340

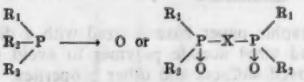
PROCESS FOR THE ANTISTATIC TREATMENT OF LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS WITH PHOSPHINE OXIDE

Yoshimi Kuwabara, Tokyo, Sadao Sugita, Hanno-shi, and Kenichi Koda and Kunihiro Fujiwara, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd.

No Drawing. Filed July 2, 1968, Ser. No. 741,883
Claims priority, application Japan, July 7, 1967, 42/43,325
Int. Cl. G03c *1/78*

U.S. Cl. 96—87A **2 Claims**

A phosphine oxide having the general formula



wherein R_1, R_2 and R_3 are individually an alkyl, aryl or aralkyl group and X is an alkylene group, is incorporated into a light sensitive silver halide photographic material to impart thereto an antistatic effect.

3,582,341

FIXER COMPOSITION

John R. Kane, Piffard, and Harry G. Morse, Rochester, N.Y., assignors to Itek Corporation, Lexington, Mass.

No Drawing. Filed Oct. 28, 1968, Ser. No. 771,325
Int. Cl. G03c *5/38*

U.S. Cl. 96—61 **2 Claims**

A process and compositions for rapidly developing and fixing a high contrast, low speed photographic film such as microfilm. The first step in the process comprises contacting an exposed photographic film with an alkaline developer composition comprising (a) a mixture of hydroquinone and 1-phenyl-3-pyrazolidone in a weight ratio of from 15:1 to 6:1 as the developing agent, the mixture contained in the developer composition in an amount of from 15 to 30 grams per liter; and (b) potassium sulfite as preservative in an amount from 60 to 120 grams per liter. Preferably, the developer composition has a pH from about 10 to 11 and contains a restrainer such as potassium bromide in an amount of from 2 to 10 grams per liter. Following contact with the developer composition, the developed film is preferably contacted with a fixer such as one comprising from 200 to 400 grams per liter sodium thiosulfate crystals, 50 to 100 grams per liter of potassium sulfite and 100 to 200 grams per liter of ammonium thiocyanate.

3,582,342

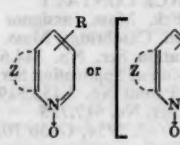
LIGHT-SENSITIVE PHOTOGRAPHIC MATERIALS

Kohei Itano, Hachioji, Masashi Nakano, Tokyo, Akira Kato, Hachioji, and Shoichiro Hoshino, Tokyo, Japan, assignors to Keuffel & Esser Company, Hoboken, N.J.

No Drawing. Filed July 14, 1967, Ser. No. 653,343
Claims priority, application Japan, July 16, 1966, 41/46,257
Int. Cl. G03c *1/52*

U.S. Cl. 96—90 **12 Claims**

A photosensitive material useful in copying processes is provided by combining dyes or colorless dye bases with photoactivators selected from N-oxide compounds of pyridine or quinoline, or quaternary salts thereof, having the general formula:



Upon exposure to light the photoactivators provide free radicals which cause a dye-forming or bleaching color change.

3,582,343

DIRECT POSITIVE SILVER HALIDE EMULSIONS CONTAINING A 5 NITRO - 2 - ARYLINDOLE NUCLEUS

John D. Mee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 677,043, Oct. 23, 1967, and Ser. No. 746,261, July 22, 1968. This application Aug. 23, 1968, Ser. No. 754,965
Int. Cl. G03c *1/10, 1/28, 1/40*

U.S. Cl. 96—106 **24 Claims**

Cyanine dyes which feature a 5-nitro-2-arylindole nucleus, and photographic silver halide emulsions containing them, are provided. The dyes are prepared from the novel intermediates 5-nitro-2-arylindole or 3-formyl-5-nitro-arylindole. A nitro group can be substituted on a 2-arylindole by reacting it with sodium nitrate in sulfuric acid. A 3-formyl-5-nitro-2-arylindole can be prepared by reacting dimethylformamide and phosphoryl chloride with a 5-nitro-2-arylindole, followed by hydrolysis.

3,582,344

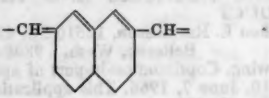
SILVER HALIDE EMULSIONS CONTAINING RED TO INFRARED SENSITIZING POLYMETHINE DYES

Donald W. Heseltine and John D. Mee, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,135
Int. Cl. G03c *1/10*

U.S. Cl. 96—106 **9 Claims**

Novel polymethine dyes are provided in which two heterocyclic nuclei of the type used in cyanine dyes are joined by the following:



The polymethine dyes of this invention are useful spectral sensitizers for photographic silver halide emulsions.

3,582,345

LIGHT DEVELOPABLE DIRECT PRINT SILVER HALIDE COMPOSITIONS CONTAINING PHOSPHONIUM SALTS

Clarence E. McBride, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 3, 1968, Ser. No. 718,340
Int. Cl. G03c *1/28*

U.S. Cl. 96—107 **6 Claims**

Photographic silver halide compositions comprising at least 10 mg. per mole of silver of a phosphonium salt of the formula:

$$(ROH)_4P^{\oplus}Z^{\ominus}$$

wherein R is an alkyl group and Z is an anion. In one aspect of this invention direct-print compositions comprising said phosphonium salts have improved photographic speed and improved image densities.

3,582,346

PHOTOGRAPHIC SILVER HALIDE EMULSION STABILIZED WITH ETHYLENE-DIUREA

Fritz Dersch, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed July 18, 1968, Ser. No. 747,034
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 7 Claims

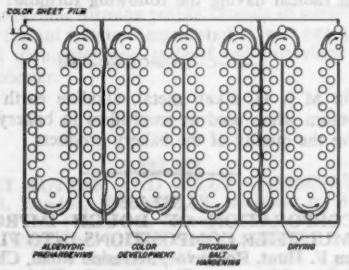
A stabilized silver halide photographic emulsion which is sensitized with alkylene oxide polymers and stabilized with ethylene-diurea.

3,582,347

PROCESSING MULTILAYER PHOTOGRAPHIC COLOR FILMS

Fred R. Holly, Jr., and N. Bruce Williams, Rochester, and Gareth N. Wall, Hilton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 5, 1968, Ser. No. 742,574
Int. Cl. G03c *1/30*
U.S. Cl. 96—111 13 Claims



A process for development of multilayer photographic color products involves progressively hardening the layers with an aldehydic prehardening solution, and after development, in an acidic zirconium salt solution. The process reduces damage to the product in continuous processing machines.

3,582,348

SILVER HALIDE EMULSIONS CONTAINING MEROCYANINE DYES HAVING A TRIAZOLO OR TETRAZOLO (1,5-a) PYRIMIDIN-7(6H)-ONE NUCLEUS

Donald W. Heseltine and Carl H. Eldredge, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 28, 1968, Ser. No. 732,543
Int. Cl. G03c *1/08, 1/28;* C09b *23/10*
U.S. Cl. 96—141 23 Claims

Merocyanine dyes are provided which feature a triazolo- or a tetrazolo (1,5-a) pyrimidin-7(6H)-one nucleus. Light sensitive photographic silver halide emulsions containing such dyes are also provided.

3,582,349

AUTOMATED FORMING OF NON-REFRIGERATED MOLDED FOOD PRODUCTS

Ben E. Rasmusson, 915 1st Ave. S., Kent, Wash. 98031

Continuation-in-part of application Ser. No. 654,058, July 18, 1967. This application June 7, 1966, Ser. No. 555,810
Int. Cl. A23g *3/00, 3/02*
U.S. Cl. 99—1 12 Claims

Non-refrigerated food products formed by feeding a conglomerate food mix in plastic state to the molds of an automated molding equipment of a type conventionally used to form frozen confections. The food mix is characterized by an essentially solid state at room temperature and a plastic state when heated above about body temperature. The mix typically includes as basic ingredients fragile, particulated food solids and an uncooked binding agent. Feeding of the mix to the equipment molds is by nondestructively injecting measured amounts of the mix through nozzle means cyclically reciprocated into and withdrawn from the molds. After solidification of the molded products by rapid cooling of the molds, the molds are briefly heated and the products withdrawn from the molds. If desired, the formed products while still cold can be provided with a high gloss dip coating.

3,582,350

INSTANTLY DISPERSIBLE PREGELATINIZED FLOUR AND STARCH COMPOSITIONS

Sanford Werbin, Dumont, N.J., and David Weinstein, Baltimore, and Irving Rubenstein, Stevenson, Md., assignors to Maryland Cup Corporation, Owings Mill, Md.

No Drawing. Filed Dec. 29, 1967, Ser. No. 694,372
Int. Cl. A23l *1/10, 1/14*
U.S. Cl. 99—94 9 Claims

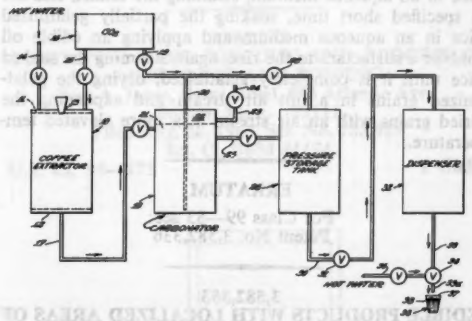
An instantly dispersible pregelatinized flour and starch composition having no lumping tendency and which will absorb moisture without the application of heat is prepared by forming an aqeuous slurry of the flour or starch at ambient temperature, admixing a hydrophobic shortening material or a blend thereof with an emulsifier, and subjecting the mixture to a brief heat treatment at a temperature between about 250° and 500° F. The product can be utilized directly for the preparation of instant pudding mixes, pie fillings, ice cream mixes and the like, and can be applied to meat, poultry and fish as a breading mix, followed by final baking or frying.

3,582,351

METHOD OF BREWING COFFEE

Forrest L. Austin, Brooklyn Center, and Richard T. Cornelius, Minneapolis, Minn., assignors to The Cornelius Company, Anoka, Minn.

Filed Mar. 20, 1968, Ser. No. 714,557
Int. Cl. A23f *1/08;* A23l *1/00*
U.S. Cl. 99—71 2 Claims



A method of brewing coffee in accordance with which freshly ground coffee is infused with a predetermined amount of hot water in a coffee extractor maintained under pressure by inert gas, such as carbon dioxide, to provide a brew of "strong coffee" having a soluble solids content of from about 10 to 15% by weight, and therefore so strong as not to be palatable for drinking purposes. At the completion of the brewing step which requires only a few minutes time, the "strong coffee" liquid is expelled from the coffee extractor through the

lower portion thereof by means of carbon dioxide gas so as not to cause any dilution, and is transferred into a pressurized carbonator vessel, held at ordinary or room temperatures, and maintained under gaseous pressure of carbon dioxide. Carbonation of the "strong coffee" liquid is effected in the carbonation vessel to an extent such that the liquid contains from 2 to 4 volumes of carbon dioxide for each unit volume of liquid. The carbonated "strong coffee" liquid is then transferred to a pressurized storage tank maintained under sufficient pressure of carbon dioxide gas to prevent substantial loss thereof from the liquid. From the pressure storage tank the carbonated "strong coffee" liquid is transferred as needed to a dispenser maintained under sufficient pressure to facilitate the discharge of the "strong coffee" through a mixing valve, in admixture with the proper amount of hot water to bring the "strong coffee" liquid to a suitable temperature and dilution for immediate consumption from a drinking cup into which the mixing valve discharges. Due to the relatively high concentration of the "strong coffee" a dilution of approximately one part of the "strong coffee" to ten parts of finished coffee beverage not only readies the liquid coffee for consumption but also effects a release of substantially all of the dissolved carbon dioxide gas from the liquid coffee so that the coffee in the drinking cup is substantially decarbonated, without, however, the formation of any objectionable amount of foam. The final coffee beverage as produced by our process, possesses the same taste and is of the same quality as that of freshly made coffee from the same coffee bean source, even though several weeks may have elapsed since the time of brewing the "strong coffee" liquid and the time of its consumption in diluted form as a beverage.

3,582,352

PREPARATION OF QUICK-COOKING RICE

Katsuharu Yasumatsu, Toyonaka, and Koshichi Sawada and Shintaro Moritaka, Suita, Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan

No Drawing. Filed Sept. 16, 1968, Ser. No. 760,065
Claims priority, application Japan, Sept. 22, 1968, 42/60,969
Int. Cl. A23l *1/10*
U.S. Cl. 99—80PS **8 Claims**

A quick-cooking rice is prepared by soaking raw white rice in an aqueous medium, steaming the soaked rice for a specified short time, soaking the partially gelatinized rice in an aqueous medium and applying an edible oil and/or a surfactant to the rice, again steaming the soaked rice until it is completely gelatinized, drying the gelatinized grains in a hot air stream and expanding the dried grains with an air stream at a more elevated temperature.

ERRATUM

For Class 99—83 see:
Patent No. 3,582,336

3,582,353

EDIBLE PRODUCTS WITH LOCALIZED AREAS OF COLORING OR FLAVORING AND PROCESS FOR MAKING SAME

Isaac N. Fehr, Jr., Richard C. Bingham, James C. Patton, John J. Russ, and Ralph H. Crocker, Jr., Dallas, Tex., assignors to Campbell Taggart Associated Bakeries, Inc., Dallas, Tex.

Filed Feb. 19, 1968, Ser. No. 706,535
Int. Cl. A21d *13/08;* **A23l** *1/26*
U.S. Cl. 99—86 **19 Claims**

An edible food product is prepared by mixing with dough ingredients particles of relatively hard shortening material having flavoring or coloring material incorporated therein and having a sharp melting point compatible with body temperature and a relatively slow flow rate so that each particle retains its integrity within a relatively small area in the product when it is baked so as to produce localized areas of concentrated flavor or color in the baked product.

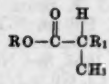
3,582,354

ADDITIVES FOR BAKERY PRODUCTS

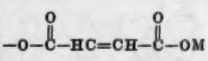
Thomas P. Kichline, Chesterfield, and James F. Conn., St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 13, 1968, Ser. No. 759,796
Int. Cl. A21d *13/08*
U.S. Cl. 99—91 **12 Claims**

Compounds having the following formula:



wherein R is a saturated, ethylenically unsaturated, or diethylenically unsaturated aliphatic hydrocarbon radical having from about 12 to about 22 carbon atoms and R_1 is a radical having the following formula:



wherein M is H, alkali metal, alkaline earth metal or ammonium when used as emulsifiers in bakery products improve the quality of the bakery products.

3,582,355

INCORPORATION OF DOUGH IMPROVING EMULSIFIER COMPOSITIONS INTO FLOUR

John F. Hunt, Rostrevor, Mereside Road, Cheshire, Mere, near Knutsford, England

Filed Oct. 19, 1966, Ser. No. 587,762
Int. Cl. A21d *2/16, 2/32*
U.S. Cl. 99—94 **3 Claims**

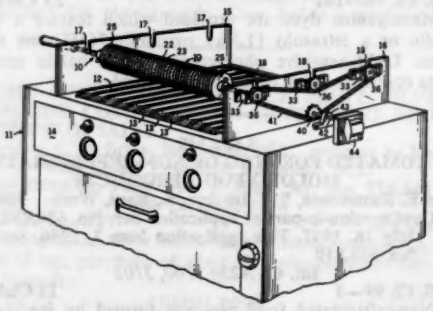
The incorporation of flour material into a mixed product by spraying melted fatty material in an atomized state into a suspension of the flour material, cooling the fatty material and collecting the resultant mixture.

3,582,356

COOKING DEVICE

Donald J. Thomas, Town and Country, Mo., assignor to Burger Chef Systems, Inc., Indianapolis, Ind.

Filed Nov. 12, 1968, Ser. No. 774,809
Int. Cl. A47j *37/04*
U.S. Cl. 99—108 **3 Claims**



The cooking device, in its rotisserie form, includes a spit on which a plurality of conductor plates are mounted.

Meat patties are disposed between the conductor plates in alternating relation, and the multiple sandwich cartridge so formed is clamped together on the spit by means of a pair of opposed end conductor plates. The spit is rotatively supported by and between a pair of plates.

3,582,357

EDIBLE MIX COMPOSITION FOR PRODUCING AN AERATED PRODUCT

Morris H. Katz, St. Louis Park, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Continuation-in-part of application Ser. No. 574,600, Aug. 24, 1966. This application Mar. 24, 1969, Ser. No. 809,911

The portion of the term of the patent subsequent to Mar. 25, 1986, has been disclaimed

Int. Cl. A23g *3/00, 5/00*

U.S. Cl. 99—139 **59 Claims**

Edible dry mix compositions for producing an aerated product of a fine, smooth, creamy consistency and containing less than 8 percent by weight fat and proteinaceous material are provided by a dry mix which contains a water-soluble film forming polysaccharide in combination with a surfactant system comprised of at least one glycerol fatty acid monoester and at least one propylene glycol fatty monoester.

3,582,358

PEANUT BUTTER AND JELLY COMBINATION

Robert H. Bundus, Riverside, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Dec. 6, 1967, Ser. No. 688,311

Int. Cl. A23l *1/38*

U.S. Cl. 99—128 **8 Claims**

Water-in-oil emulsifiers are added to peanut butter and the peanut butter is then stable when in contact with jelly, jam or marshmallow. Some oil-in-water emulsifier can be included to obtain increased stiffness of the peanut butter.

3,582,359

GUM CONFECTIONS CONTAINING 5–15 D.E. STARCH HYDROLYZATE

Harold Edwin Horn, Oak Lawn, and Bruce Alan Kimball, Chicago, Ill., assignors to CPC International Inc.

No Drawing. Filed Oct. 30, 1968, Ser. No. 771,982

Int. Cl. A23g *3/00*

U.S. Cl. 99—134 **12 Claims**

Low D.E. starch hydrolysates having D.E.'s of about 5 to 25 replace up to 70% of the sweetening constituent, e.g. sucrose and/or corn syrup, in a gum confection to thereby reduce drying time and improve resiliency, strength, firmness, and tenderness.

3,582,360

COCOA FLAVORING COMPOSITION CONTAINING 2-PHENYL - 2 - ALKENALS AND METHOD OF USING SAME

Michel van Praag, Matawan, N.J., and Herbert S. Stein, Rosedale, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Filed Apr. 26, 1968, Ser. No. 724,611

Int. Cl. A23l *1/22*; C07c *47/48*

U.S. Cl. 99—140 **6 Claims**

Novel unsaturated aldehydes, particularly 2-phenyl-2-alkenals, useful for preparing flavoring compositions and food compositions, particularly those having chocolate or cocoa flavor and/or aroma qualities; flavoring and food compositions containing such aldehydes; and methods for preparing such aldehydes and compositions.

3,582,361

FOOD FLAVORING COMPOSITIONS AND PROCESS OF MAKING AND USING SAME

Heinz Huth, Holzminden, Germany, assignor to Dragoco Gerberding & Co. G.m.b.H., Holzminden (Weser), Germany

No Drawing. Continuation-in-part of application Ser. No. 402,926, Oct. 9, 1964, now Patent No. 3,424,592. This application June 10, 1968, Ser. No. 735,516

Claims priority, application Germany, Oct. 12, 1963, P 12 39 925.6

Int. Cl. A23l *1/22*

U.S. Cl. 99—140 **12 Claims**

Composition for imparting fried onion flavor, taste, and aroma to food comprising an emulsion of

(a) highly concentrated onion juice,
(b) a nutritive oil, and
(c) a fat emulsifier.

The oil content is preferably between 10% and 36%, the water content between 10% and 22%, the emulsifier content between 1% and 5% of the oil present, and the soluble onion solids content between 37% and 76%, while the viscosity is between 20,000 and 60,000 centipoises. By spray drying, vacuum drying, or freeze drying, the emulsion is converted into a solid composition in dry, particulate, freely flowing form, wherein preferably an encapsulating solid substance such as a vegetable gum, starch products, and other suitable materials are added.

3,582,362

DRY DRESSING MIX AND METHOD FOR MANUFACTURE

Harvey J. Drews, Rolling Meadows, and Thomas W. Collins, Elgin, Ill., assignors to Kraftco Corporation, New York, N.Y.

No Drawing. Filed Feb. 26, 1968, Ser. No. 707,966

Int. Cl. A23l *1/24*

U.S. Cl. 99—144 **8 Claims**

A substantially dry composition and a method for making the composition are provided. The composition may be combined with an edible fluid to provide a fluid dressing for use as a salad dressing, marinade or the like. The composition includes an edible carrier which has been treated to reduce the bulk density thereof, an edible acid and a liquid fat. The fat is present at a level of from about 25 percent to about 400 percent by weight of the carrier.

3,582,363

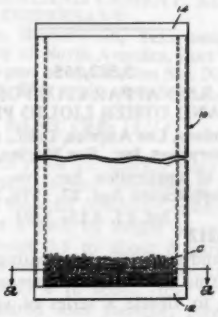
CONTAINER WITH POPCORN AND PROCESS OF PACKAGING AND POPPING

Sam A. Jones, Essex Hotel, 695 Atlantic Ave., Boston, Mass. 02111

Filed Aug. 20, 1968, Ser. No. 753,959

Int. Cl. B65d *81/34*

U.S. Cl. 99—171 **1 Claim**



A process for packaging and popping natural popcorn is disclosed which comprises packaging of kernels in

their natural condition under a vacuum and then applying heat internally to the said kernels until they are popped and substantially fill the container.

3,582,364

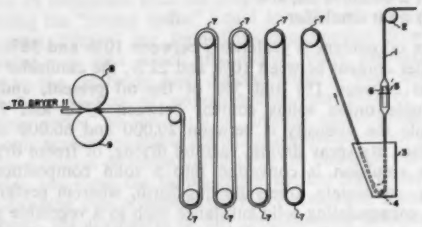
SAUSAGE CASING WITH IMPROVED RELEASE COATING

Henry J. Rose and Albin F. Turbak, Danville, Ill., assignors to Tee-Pak, Inc.

Filed May 8, 1968, Ser. No. 727,446

Int. Cl. A22c *13/00*; C08h *9/00*

U.S. Cl. 99—176 **17 Claims**



The inside surface of gel cellulosic or other sausage casing is contacted with an aqueous emulsion containing (A) a hydrophobic material with a reactive functional group, such as either a dimer of a fatty ketene, a fatty isocyanate, an N-fatty-imine or a fatty chromium complex, (B) a water-insoluble, monomeric fatty material with a polar end group and having an HLB number from 1 to 10, e.g. a fatty alcohol, fatty amine, fatty acid, fatty amide or fatty ester, and (C) an at least partially water-soluble surfactant having an HLB number greater than 7 and giving a surface tension less than 50 dynes/cm.^{2} at 0.2% concentration in water, e.g. a propylene oxide or ethylene oxide ether adduct. In (A), (B) and (C), the fatty substituents are preferably of about the same chain length. The three ingredients of the emulsion are usually modified with a buffer such as sodium bicarbonate to adjust and maintain the pH and are so proportioned and chosen such that coating produced on the inner surface of the casing has a contact angle for droplets of water of about 70°–90° and a contact angle for oils of about 40°–70°. The surface properties of the meat-contacting side of the coated casing, after drying, are thereby modified so that the casing can be easily stripped from the sausage which is encased there in and yet does not tend to cause the sausage to fat out.

3,582,365

METHOD AND APPARATUS FOR TREATING MILK AND OTHER LIQUID PRODUCTS

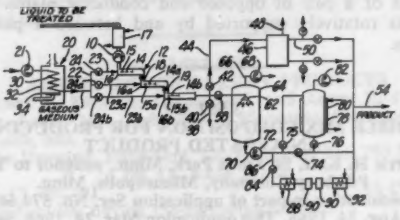
Ernest E. Lindsey, Los Angeles, Calif., assignor to Food Enterprises, Inc., San Marino, Calif.

Continuation of application Ser. No. 702,329, Feb. 1, 1968. This application Apr. 27, 1970, Ser. No. 29,759

Int. Cl. A23c *3/02*

U.S. Cl. 99—212 **15 Claims**

A process and apparatus for treating liquids by stage-wise sonic mixing thereof with a gaseous medium (vapor or gas) used to vibrate a series of vibratory members spaced from each other along a laterally-confined flow path. Treatment may involve effecting chemical reactions between the liquid and the gaseous medium, sterilization of liquids, steam-washing of liquids and other effects. The



resulting dispersions may be useful products or may be separated into their constituents.

3,582,366

COMPOSITION AND METHOD FOR RENDERING SILVER SURFACES TARNISH RESISTANT

Carl H. Brieger, Berkeley, and Ludwig Rosenstein, San Francisco, Calif.; said Brieger assignor to E-Z-EST Products Co., Inc., Oakland, Calif.

No Drawing. Filed Oct. 21, 1965, Ser. No. 500,243

Int. Cl. C08h *9/06*; C09f; C09g *1/08*

U.S. Cl. 106—10 **3 Claims**

Elemental sulfur in finely divided form in a silver polish renders a silver surface to which the polish is applied resistant to tarnishing.

3,582,367

CORROSION-PROOFING COMPOSITION AND METHOD

Charles R. Miller, Ashland, Ky., and Paul J. Holtzapfel, Ironton, Ohio, assignors to Ashland Oil & Refining Company, Houston, Tex.

No Drawing. Filed June 19, 1968, Ser. No. 738,114

Int. Cl. C09d *5/08*; C08h *13/00*

U.S. Cl. 106—14 **10 Claims**

Bituminous compositions containing particles of inorganic filler which are highly resistant to settling, the particles of inorganic filler being individually coated with a water-insoluble salt of a waxy hydrocarbon organic acid. Method of preparing compositions containing a bitumen and an inorganic filler in which the filler is dispersed in a solvent solution of water-insoluble organic acid salt. Method of protecting vehicular underbodies by applying thereto compositions of the above-described character.

3,582,368

CORROSION-INHIBITING COMPOSITION

Harold Karl Salzberg, Cape Coral, Fla., assignor to Borden Inc., New York, N.Y.

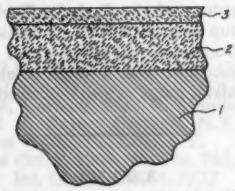
No Drawing. Filed Dec. 30, 1968, Ser. No. 788,013

Int. Cl. C09d *5/08*

U.S. Cl. 106—14 **9 Claims**

This invention relates to a corrosion-inhibiting composition comprising casein, an epoxidized oil and a hexavalent chromium compound, the proportions by weight being, for each part by weight casein, from about .1 to about .5 part by weight of epoxidized oil and from about .005 to about .3 part by weight hexavalent chromium compound (calculated as ammonium dichromate). The invention also comprises the method of inhibiting the corrosion of surfaces of articles composed of iron and steel by application thereover of the corrosion-inhibiting composition and drying thereof at room temperature.

3,582,369
LININGS FOR STEEL INGOT MOLDS AND FOUNDRY MOLDS
Henry Nouveau, Saint Germain-les-Corbeil, Seine-et-Oise, France, assignor to Societe Anonyme Produits Metallurgie Doittau S.A., Corbeil-Essonnes, France
Continuation-in-part of application Ser. No. 522,648, Jan. 24, 1966. This application July 18, 1968, Ser. No. 776,839
Claims priority, application France, May 6, 1965, 16,063
Int. Cl. B28b *7/36*
U.S. Cl. 106—38.22 1 Claim



A lining for a metallurgical mold comprising a layer of an agglomerated mixture of refractory particles of a medium particle size, of fibers, and of a small amount of an exothermic mixture of a small particle size, said mixture being agglomerated by means of a synthetic resin.

3,582,370
GLASS-CERAMIC ARTICLES
George H. Beall, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
No Drawing. Filed Nov. 5, 1968, Ser. No. 773,646
Int. Cl. C03c *3/04, 3/22*
U.S. Cl. 106—39DV 3 Claims
This invention relates to the manufacture of glass-ceramic articles in the $RO\text{-}Al_2O_3\text{-}SiO_2$ composition field wherein RO consists of MgO and/or CaO and wherein WO_3 and, optionally, MoO_3 act as nucleating agents. Mullite, $MgWO_4$, $CaWO_4$, $MgMoO_4$, Ca—MoO_4 and an as yet unidentified silicate crystal constitute the principal crystal phases.

3,582,371
BETA-SPODUMENE-ANATASE GLASS-CERAMIC ARTICLE
Adrian A. Bruno, Painted Post, Hermann L. Rittler, Horseheads, and Maurice I. Rosenfield, Elmira, N.Y., assignors to Corning Glass Works, Corning, N.Y.
No Drawing. Filed Jan. 13, 1969, Ser. No. 790,827
Int. Cl. C04b *33/00*
U.S. Cl. 106—39 1 Claim
This invention relates to glass-ceramic articles in the $Li_2O\text{-}MgO\text{-}Al_2O_3\text{-}SiO_2$ composition system nucleated with TiO_2 which are highly resistant to food staining because any TiO_2 crystallization present consists essentially entirely of anatase rather than rutile.

3,582,372
BINDER FOR REFRACTORY PRODUCTS
George H. Criss, Bethel Park, and George F. Carini, Pittsburgh, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.
No Drawing. Filed Aug. 22, 1968, Ser. No. 754,710
Int. Cl. C04b *35/04*
U.S. Cl. 106—55 8 Claims
A refractory product with a binder consisting essentially of boron phosphate and up to 50%, by weight soluble sodium phosphate.

3,582,373
REFRACTORY MAGNESIA
William Cecil Gilpin, Woodhouse, near Worksop, and Dennis Woodhouse, Trevor Wilkinson Lythe, and Gerald Charles Padgett, Worksop, England, assignors to The British Periclase Company Limited, Hartlepool, England
No Drawing. Continuation-in-part of application Ser. No. 517,464, Dec. 29, 1965. This application Nov. 7, 1967, Ser. No. 681,109
Claims priority, application Great Britain, Dec. 30, 1964, 52,879/64
Int. Cl. C04b *35/04*
U.S. Cl. 106—58 6 Claims
A dead-burnt refractory magnesia suitable for use in the manufacture of high hot strength magnesia refractories comprises by weight 90 to 95% magnesium oxide, up to 5% calcium oxide, the ratio of lime to silica contents being between 1.5:1 and 2.2:1, iron oxide and alumina in total amount not exceeding one quarter the total weight of lime and silica, boron oxide up to 0.1% and an alkali metal oxide content not less than the content of boron oxide and not exceeding 0.25%.

3,582,374
REFRACTORY MORTAR
Kermit Mark Bonar, Pittsburgh, and Frank H. Walther and Daniel E. Reardon, Bethel Park, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.
No Drawing. Filed June 3, 1968, Ser. No. 733,819
Int. Cl. C04b *35/10, 35/12*
U.S. Cl. 106—66 4 Claims
A refractory mortar comprising finely divided alumina, chromic oxide and titania, and plasticizing agents and binders.

3,582,375
WELL CEMENTING COMPOSITION
Arthur F. Tragesser, Jr., Houston, Tex., assignor to The Western Company of North America, Fort Worth, Tex.
Filed Mar. 21, 1968, Ser. No. 716,701
Int. Cl. C04b *7/02, 13/24*
U.S. Cl. 106—90 6 Claims
A cement slurry composition especially designed for the setting of multiple strings of tubing in a multiple completion well wherein the setting of the cement is retarded for at least 10 hours, comprising an oil-well cement and from 10 to 16 percent of clay together with relatively small proportions of retarding and dispersing agents, no fluid loss additives, and no more than about 100 percent water, based on the dry weight of cement.

3,582,376
QUICK-SETTING CEMENT COMPOSITION CONTAINING PORTLAND CEMENT, ALPHA GYPSUM AND A DISPERSANT
Thomas S. Ames, Brownwood, Tex., assignor to The Western Company of North America, Fort Worth, Tex.
Continuation-in-part of application Ser. No. 546,472, Apr. 15, 1966. This application Sept. 9, 1968, Ser. No. 767,893
Int. Cl. C04b *13/14*
U.S. Cl. 106—90 8 Claims
Craters and earth voids are quickly filled with a high-strength, quick-setting cement composition comprising a mixture of cement material consisting essentially of from about 9.5 to about 4 parts by weight of calcium sulfate hemihydrate to about 0.5 to about 6 parts by weight of portland cement and water which is present in a quantity of from about 22% to about 70% by weight. According to the desired uses therefor, accelerators, retardants or disbursants are added to the mixture. The preferred quick-setting cement composition of this in-

vention consists of from 9.5 to 7 parts by weight of alpha gypsum to 0.5 to 30 parts by weight of portland cement along with from about 22% to about 40% water by weight, based upon the cement material.

3,582,377

STEAM CURABLE COMPOSITION AND METHOD

Ronald M. Hays, Edina, and Iwao Iwasaki, Minneapolis, Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

No Drawing. Filed Nov. 24, 1967, Ser. No. 685,297

Int. Cl. C04b *7/14*

U.S. Cl. 106—117 **7 Claims**

An improved composition for and method of making precast autoclave-cured masonry articles based upon the discovery that part or all of the portland cement and/or silica flour heretofore used may be replaced by abundant natural and waste calcareous non-cement substances and mixtures thereof ground to cement fineness. Slags, lime, limestone and dolomite are exemplary of readily available replacement materials.

3,582,378

PROCESSING PARTIALLY REHYDRATED METAKAOLIN PIGMENT

Barry S. Miller, Roselle, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Township of Woodbridge, N.J.

No Drawing. Filed May 14, 1968, Ser. No. 728,893

Int. Cl. C08h *17/06*; C09c *1/42*; C08f *45/06*

U.S. Cl. 106—288Q **8 Claims**

A synthetic anionic water-soluble organic polymeric electrolyte is employed as the dispersant for an adsorptive acidic hydrated aluminum silicate pigment obtained by calcining kaolin clay and then partially rehydrating the calcined clay. The aqueous pigment dispersion is employed in the preparation of coating compositions for applying to paper to make pressure-sensitive record material.

3,582,379

ALKALI METAL ALUMINO SILICATES, METHODS FOR THEIR PRODUCTION AND COMPOSITIONS THEREOF

Lowell E. Hackbarth and Joseph T. Crockett, Bel Air, Md., assignors to J. M. Huber Corporation, Locust, N.J.

No Drawing. Filed May 21, 1968, Ser. No. 730,892

Int. Cl. C09c *1/28, 1/40*

U.S. Cl. 106—288B **18 Claims**

The subject matter of the following specification concerns the production of finely divided materials useful as pigments, moisture conditioners, paper fillers, and in rubber reinforcement and the like. Considering present economics, perhaps the most practical embodiment of the subject matter employs the reaction of a soluble sodium silicate and aluminum sulfate in producing precipitates commonly known and identifiable as sodium alumino silicates, the precipitate being ultimately collected as a dried particulate material of sub-micron particle size. The disclosed process involves conducting this general type of reaction in the presence of calculated quantity of sodium sulfate from the outset of the reaction whereby economics are improved and highly refined modifications in the characteristic of the final materials become obtainable. The reaction may be varied according to several conditions, such as pH, temperature, concentration, manner of feeding materials and the like whereby to better adapt the new materials to highly specialized needs, such as in rubber compounding and paper production.

3,582,380

PIGMENT COMPOSITIONS

Alexander Hamilton, 63 Whitton Drive, Giffnock, Glasgow, Scotland

No Drawing. Filed July 19, 1968, Ser. No. 745,981

Claims priority, application Great Britain, July 21, 1967, 33,537/67

Int. Cl. C08h *17/00, 17/02*

U.S. Cl. 106—288Q **17 Claims**

Pigment compositions readily dispersible in organic media such as printing ink media and alkyd paint media are disclosed as comprising a pigment and a salt of a dialkyl-sulphosuccinic acid and a non-alkali metal selected from certain groups of the Periodic Table of Elements other than Group Ia thereof. The production of the novel compositions from pigment, alkali metal or ammonium dialkyl-sulphosuccinate and a water-soluble salt of the aforesaid non-alkali metal is also described.

3,582,381

PROCESS FOR CONVERTING ARYL PARAROSANILINE SULFONIC ACID DYESTUFFS INTO PIGMENTS

Theodor Papenfuss, Niederhofheim, Taunus, Heinz Rentél, Schonberg, Taunus, and Ernst Spietschka, Oberauroff, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 2, 1968, Ser. No. 749,566

Claims priority, application Germany, Aug. 12, 1967, P 15 92 876.4

Int. Cl. C09c *3/02*

U.S. Cl. 106—288Q **5 Claims**

A process for converting aryl-pararosaniline sulfonic acid dyestuffs into pigments having high tinctorial strength and soft grain and being easily dispersible, in which process aqueous suspensions of said dyestuffs are treated with aqueous emulsions of vehicles at elevated temperature and the pigments are recovered.

3,582,382

METHOD OF PRODUCING NACREOUS PIGMENT

Akira Watanabe and Ryota Miyoshi, Tokyo, Japan, assignors to Nihon Koken Kogyo Company, Ltd., Tokyo, Japan

Filed July 15, 1968, Ser. No. 744,835

Claims priority, application Japan, July 20, 1967, 42/46,328; Aug. 15, 1967, 42/52,009

Int. Cl. C09c *1/28*

U.S. Cl. 106—291 **7 Claims**

A nacreous pigment comprising a translucent layer of titanium dioxide deposited on a translucent flake substrate, such as mica, is made by continuously contacting the substrate particles with titanium tetrachloride vapor at atmospheric pressure, followed by continuously hydrolyzing the deposited titanium tetrachloride to form titanium dioxide.

3,582,383

MODIFIED ZINC OXIDE COMPOSITION

Robert S. Bowman, Pittsburgh, Pa., assignor to St. Joseph Lead Company, New York, N.Y.

No Drawing. Filed June 13, 1968, Ser. No. 736,579

Int. Cl. C09c *1/04*

U.S. Cl. 106—296 **4 Claims**

The tendency of oil based paints containing lithiated zinc oxide pigment to body or gel on storage is destroyed by prior treatment of the pigment with carbon dioxide.

3,582,384
PIGMENT FORMULATIONS
Horst Belde, Ewald Daubach, and Enno Luebcke, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed May 23, 1969, Ser. No. 827,149
Claims priority, application Germany, May 30, 1968, P 17 69 488.1
Int. Cl. C09c *3/00*
U.S. Cl. 106—308 2 Claims

New formulations comprising pigment dyes, polyethylene and oleyl monoethanolamide which are outstandingly suitable for mass coloring thermoplastics.

3,582,385
THERMALLY CRYSTALLIZABLE GLASS AND GLASS-CERAMIC ARTICLE
David A. Duke, Corning, Max R. Montierth, Big Flats, and Richard F. Reade, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Oct. 7, 1968, Ser. No. 765,467
Int. Cl. C03c *3/04, 3/22*
U.S. Cl. 106—390V 2 Claims

This invention relates to the production of glass-ceramic articles in the Li_2O-BaO-Al_2O_3-SiO_2 composition field which, when nucleated with TiO_2 and, optionally, ZrO_2 to form beta-spodumene solid solution and celsian as the principal crystal phases, exhibit an average coefficient of thermal expansion (25°–900° C.) of less than 15×10^{-7}/° C. and demonstrate excellent dimensional stability when subjected for long periods of time at temperatures up to about 800° C. or when rapidly thermally cycled from room temperature to temperatures about 800° C. Such glass-ceramic articles are especially suitable for the manufacture of regenerative heat exchangers for use with turbine engines.

3,582,386
RESIN BONDING PROCESS
Basil Yankopoulos, Watertown, Mass., assignor to Amicon Corporation, Lexington, Mass.
No Drawing. Filed Aug. 29, 1968, Ser. No. 756,315
Int. Cl. B44d *1/094, 1/44*
U.S. Cl. 117—21 6 Claims

A process for bonding polyelectrolyte complex resin coating to the surface of other materials, said process utilizing an adhesive interlayer comprising a liquid adhesive with polyelectrolyte complex resin particles partly embedded in the liquid adhesive and a step whereby such particles are dissolved by a solvent therefor to become an integral part of said coating.

3,582,387
METAL PLATING METHOD AND COMPOSITION
Hoyt H. Todd, La Habra, Calif., assignor of fractional part interest to Jess M. Roberts, Ontario, Calif.
No Drawing. Continuation-in-part of application Ser. No. 560,935, May 16, 1966, which is a continuation of application Ser. No. 311,075, Sept. 24, 1963, which is a continuation-in-part of applications Ser. No. 796,162, Feb. 27, 1959, and Ser. No. 156,986, Dec. 4, 1961, the latter being a continuation-in-part of applications Ser. No. 694,387, Nov. 4, 1957, and Ser. No. 765,715, Oct. 3, 1958, the latter being a continuation-in-part of application Ser. No. 694,389, Nov. 4, 1957. This application July 31, 1969, Ser. No. 846,618
Int. Cl. B44d *11/34*
U.S. Cl. 117—22 18 Claims

For the purpose of plating a metal object with a phosphorus alloy, the metal object is coated with a mixture in finely divided form of an oxygen-containing pentavalent phosphorus compound of a metal selected from the group consisting of nickel, cobalt, iron and copper together with an additional quantity in some form of at least one metal of the group.

3,582,388
RIGIDFIED SYNTHETIC RESIN ARTICLE AND METHOD FOR MAKING SAME
Vance A. Stayner, Wauconda, Ill., assignor to Federal-Huber Corp., Chicago, Ill.
Filed June 24, 1968, Ser. No. 739,429
Int. Cl. B44d *1/08, 1/12*
U.S. Cl. 117—27 11 Claims

Method for the production of rigidified synthetic resin articles, particularly based upon acrylonitrile-butadiene-styrene (ABS) resins and acrylic resins, wherein glass fibers are deposited on a relatively thin sheet of the resin, and bonded thereto by means of a bonding composition including an unsaturated polyester resin containing an inert organic solvent diluent which renders the surface of the sheet more receptive to the polyester bonding resin and promotes molecular adhesion between the bonding resin and the sheet, the composition also containing finely divided siliceous particles which distribute the stresses throughout the polyester resin matrix.

3,582,389
METHOD FOR METALLIZING PHOSPHOR SCREENS
Theodore A. Saulnier, Lancaster, Pa., assignor to RCA Corporation
No Drawing. Filed Dec. 26, 1967, Ser. No. 693,058
Int. Cl. H01j *31/20*
U.S. Cl. 117—33.5 9 Claims

A method for metallizing a phosphor screen, as for a cathode ray tube, including the steps of producing upon the surface of the phosphor screen a volatilizable substrate in the form of a resin film from an aqueous filming emulsion consisting essentially of an acrylate copolymer, evaporating metal upon the substrate to form a metal layer thereon, and then volatilizing the substrate. In the disclosed method, the filming emulsion contains at least one of (1) a neutralizing agent in sufficient quantity to adjust the emulsion to a pH in the range of 4.0 to 8.0, (2) a boric acid complex of polyvinyl alcohol in an amount up to about 1.0 weight percent of the acrylate solids present in the emulsion, (3) colloidal silica in an amount up to about 25 weight percent of the weight of acrylate solids present in the emulsion, and (4) soluble silicate in an amount up to about 2 weight percent of the acrylate solids present in the emulsion.

3,582,390
METHOD OF METALLIZING PHOSPHOR SCREENS USING AN AQUEOUS EMULSION CONTAINING HYDROGEN PEROXIDE
Theodore A. Saulnier, Lancaster, Pa., assignor to RCA Corporation
No Drawing. Filed Sept. 17, 1968, Ser. No. 760,364
Int. Cl. H01j *31/20*
U.S. Cl. 117—35 7 Claims

A method for metallizing a phosphor screen for a cathode ray tube including the steps of producing upon the surface of the phosphor screen a volatilizable sub-

strate from an aqueous emulsion of a water-insoluble, film-forming resin, depositing a metal layer upon the substrate, and then volatilizing the substrate. In the disclosed method, the aqueous emulsion contains minor amounts of hydrogen peroxide and a water-soluble, film-forming organic polymer. Other additives, such as colloidal silica, may be present in the emulsion.

3,582,391

PAPER COATED WITH FORM CONTAINING IMAGE FORMING MEANS

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Division of application Ser. No. 451,617, Apr. 28, 1965, now Patent No. 3,511,788, which is a continuation of application Ser. No. 430,193, Feb. 3, 1965, which in turn is a continuation-in-part of application Ser. No. 319,512, Oct. 28, 1963. This application Aug. 27, 1969, Ser. No. 853,476

Int. Cl. B41m *5/22*

U.S. Cl. 117—36.2 5 Claims

Paper is disclosed which is coated on one side with a combination of (A) a cured, open-celled, foam composition comprising (1) a plastisol and (2) a copolymer of SiO_2 units and units selected from the group consisting of $(CH_3)_3SiO_{1/2}$ and $Q(CH_3)_2SiO_{1/2}$ units, wherein Q is a radical containing a solubilizing group that makes the copolymer compatible with the plastisol, and the ratio of SiO_2 units to the total $(CH_3)_3Si$ and $Q(CH_3)_2Si$ units is in the range of 1:0.6 to 1:1.2, and (B) an essentially colorless material capable of reacting upon contact with a second essentially colorless material to produce a colored image, the other side of the paper containing said second essentially colorless material.

3,582,392

METHOD FOR PREPARING NON-METALLIC SURFACE FOR METALLIZING

Samuel Wein, deceased, late of Quincy, Mass.; by Donald W. Berman, executor, 56 Plain St., South Braintree, Mass. 02185

No Drawing. Filed Aug. 13, 1968, Ser. No. 752,132

Int. Cl. B44d *1/092;* C23c *3/02*

U.S. Cl. 117—47 1 Claim

A single-step process is described to replace the conventional consecutive steps of sensitizing and super-sensitizing a non-metallic surface prior to application of a metallizing solution such as alkaline chelated copper. The new process comprises simultaneous spraying of aqueous alkaline tin solution and an aqueous solution of gluconic acid and silver salt.

3,582,393

METHOD OF PRODUCING POROUS SHEET MATERIAL

Tatsunori Shikada, Osaka, Japan, assignor to Kanegafuchi Boseki Kabushiki Kaisha

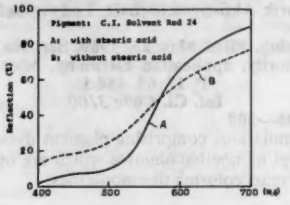
Filed Nov. 4, 1968, Ser. No. 773,234

Claims priority, application Japan, Nov. 18, 1967, 42/74,355

Int. Cl. D06n *3/14;* B44d *1/44*

U.S. Cl. 117—63 12 Claims

A hygroscopic organic solvent based coating solution containing polyurethane and 1–30% by weight (based on the polyurethane) of a higher fatty acid is applied to a surface of a base material. The applied coating solution is then coagulated in a coagulating bath consisting of an aqueous solution of an inorganic salt. It is then washed and dried. The fatty acid is selected from the



group consisting of stearic acid, myristic acid, palmitic acid, lauric acid and oleic acid.

3,582,394

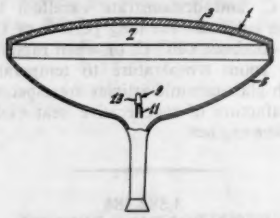
METHOD OF COATING WIDE-ANGLE CATHODE RAY PICTURE TUBE ENVELOPES

Robert E. Salveter, Jr., Marion, Ind., assignor to RCA Corporation

Filed Dec. 16, 1968, Ser. No. 783,946

Int. Cl. B44d *5/12, 5/00*

U.S. Cl. 117—97 3 Claims



An improved method of evaporating metal coatings on the major inner surface of wide-angle cathode ray picture tube envelopes utilizes a frusto-conical evaporator comprising, for example, a frusto-conical heating coil and a frusto-conical metal sleeve. With this method, the ratio of the metal thickness at the edge to the metal thickness at the center of the envelope faceplate is substantially greater than the ratio previously obtained. In the manufacture of black-and-white television picture tubes, application of the frusto-conical evaporator should substantially reduce the amount of tube rejects.

3,582,395

PROTECTIVE COATINGS FOR GLASS SURFACES

Violeta F. Adams, Piscataway, N.J., Paul Lagally, Annapolis, Md., Gilbert L. Marshall, Boalsburg, Pa., and Pamela M. Rickett, Chester, Va., assignors to Brockway Glass Company, Inc., Brockway, Pa.

No Drawing. Continuation of abandoned application Ser. No. 632,435, Apr. 20, 1967. This application Feb. 2, 1970, Ser. No. 7,368

Int. Cl. C03c *17/00*

U.S. Cl. 117—124 6 Claims

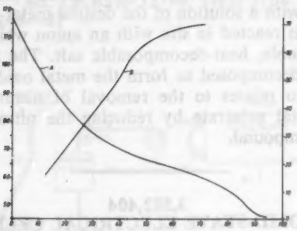
A method for increasing the scratch resistance of a glass surface by treating the surface, as by spraying, while at a temperature between the strain point and the softening point of the glass, with an alkylsilyl titanate, such as titanium-tetrakis-trimethylsilyl-oxide. The resulting surface film of silica-titania provdes a protective coating for the glass surface and can be top-coated with a suitable lubricating agent.

3,582,396

POLYURETHANE MICROPOROUS SHEET STRUCTURES AND A PROCESS FOR THE PREPARATION THEREOF

Klaus König, Leverkusen, Harro Träubel, Leverkusen-Kuepperstag, Bruno Zorn, Cologne-Flittard, and Artur Reischl, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 31, 1968, Ser. No. 749,154
Claims priority, application Germany, Aug. 9, 1967, F 53,184
Int. Cl. C08j *1/14;* B32b *3/00*
U.S. Cl. 117—135.5 4 Claims



Polyurethane microporous sheets are prepared by reacting an organic compound containing at least two terminal hydroxyl groups and having a molecular weight of from about 500 to about 10,000, and a chain lengthening agent containing at least two hydroxyl or amino groups and having a molecular weight of from about 50 to about 600, the reactive groups of this extender being within a factor of 5 as compared to the reactivity of the hydroxyl groups of the compound having a molecular weight of from 500 to 10,000, and an organic polyisocyanate in an amount such that the NCO to OH or the NCO to amino plus hydroxyl ratio is from about 0.8 to 2, the reactants forming a product which when in a homogeneous state exhibits a Shore A hardness of at least 50 and a tensile strength of at least 50 kg./cm.^{2}, the reaction being conducted in a 10 to 80 percent by volume solution at a temperature of up to about 150° C., the solvent or mixture of solvents of the solution exhibiting the following criteria:

(a) dissolves the starting material at the initial reaction temperature,
(b) dissolves the polyurethane being formed less and less readily as the degree in polyaddition increases and finally permits the polyurethane to gel after not more than 20 minutes under the reaction conditions,
(c) does not cause substantial swelling of the resulting polyurethane, and
(d) has an evaporation number high enough to insure its presence in sufficient quantity under the reaction conditions until the film solidifies.

3,582,397

ARTIFICIAL LEATHER

Kei Shibata, Imiya-shi, Japan, assignor to Ajinomoto Co. Inc., Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 471,398, July 12, 1965. This application Sept. 16, 1969, Ser. No. 858,530
Claims priority, application Japan, Aug. 12, 1964, 39/46,637
Int. Cl. D06n *3/04, 3/12*
U.S. Cl. 117—138.8 1 Claim

Artificial leather consisting of (1) a base material layer in the form of a flexible sheet of at least one of natural fibers artificial fibers, synthetic fibers, inorganic fibers and resinous sheets, and (2) a superposed surface layer of at least one lower alkyl ester polymer of N-carboxyglutamic acid. The artificial leather has excellent mechanical properties, pliability, resistance to blocking, resistance to heat, moisture permeability and resistance to washing and also desirable aesthetic properties comparable to those of natural leather, such as appearance and feel.

3,582,398

POLYCARBONATE SUBSTRATE WITH AN ACRYLATE COATING THEREON

Harold R. Ringler, Wayne, Mich., assignor to General Electric Company

No Drawing. Filed May 18, 1965, Ser. No. 456,819
Int. Cl. B32b *27/08*
U.S. Cl. 117—33.3 2 Claims

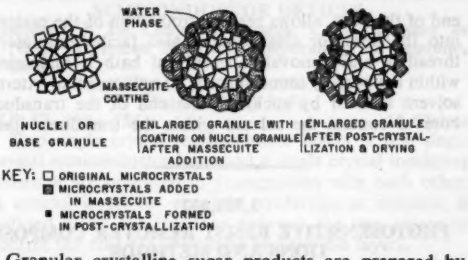
A thermoplastic part having an aromatic polycarbonate resin substrate of 2,2'-bis(4-hydroxyphenyl)propane and a transparent polymethylmethacrylate coating thereon, which coating can in addition contain an ultraviolet light absorbent.

3,582,399

PROCESS FOR PREPARING GRANULAR CRYSTALLINE SUGAR PRODUCTS

William C. Black, Cedar Rapids, Iowa, assignor to Penick & Ford Limited, Cedar Rapids, Iowa

Filed July 15, 1968, Ser. No. 744,958
Int. Cl. C13f *3/00;* C13k *1/10*
U.S. Cl. 127—58 15 Claims


WATER PHASE
MASSECUITE COATING
NUCLEI OR BASE GRANULE
ENLARGED GRANULE WITH COATING ON NUCLEI GRANULE AFTER MASSECUITE ADDITION
ENLARGED GRANULE AFTER POST-CRYSTALLIZATION & DRYING
KEY: ORIGINAL MICROCRYSTALS
MICROCRYSTALS ADDED IN MASSECUITE
MICROCRYSTALS FORMED IN POST-CRYSTALLIZATION

Granular crystalline sugar products are prepared by granule enlargement of a preformed or recycled starting material comprising Massecuite Aggregated Microcrystalline Sugar granules. The granules of the starting material are composed essentially of cohered sugar microcrystals with internal capillary networks capable of absorbing water. In a preferred embodiment, a sugar massecuite is applied to the granular starting material, the massecuite comprising microcrystalline sugar suspended in a saturated aqueous solution of crystallizable sugar. The massecuite is distributed on and coats the exteriors of the individual granules. By removal of free water from the coated massecuite layers, the deposited microcrystals are integrated and additional sugar microcrystals are deposited from the solution phase of the coated massecuite to form enlarged granules of similar structure and properties to the starting material. The process is particularly applicable to the preparation of free-flowing granular crystalline sugar products containing a minor proportion of non-crystallizable sugar which would normally impart a sticky characteristic to the product, such as the preparation of crystalline dextrose granules from a Total Sugar starch hydrolyzate.

3,582,400

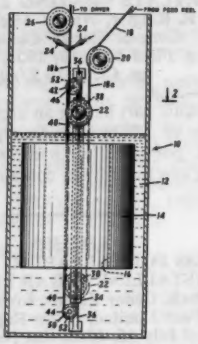
APPARATUS AND METHODS FOR CLEANING STRIP MATERIALS

Arthur J. Miller, Horizon Towers N., Fort Lee, N.J. 07024

Filed Nov. 21, 1969, Ser. No. 878,771
Int. Cl. B08b *7/00*
U.S. Cl. 134—1 17 Claims

Apparatus and methods for ultrasonically cleaning fragile strip materials, such as motion picture film and

the like. The strip material is passed in a double run through a solvent bath located within the bore of a generally cylindrical electromechanical transducer. A material transport mechanism, in part selectively reciprocable between a threading position adjacent one end of the transducer bore and a running position adjacent the other



end of the bore, allows ready introduction of the material into the bore for cleaning and also facilitates material threading and removal. The solvent bath is maintained within the bore by immersing the transducer in an external solvent bath or by enclosing one end of the transducer bore to contain the solvent within the transducer itself.

3,582,401

PHOTOSENSITIVE RESIST REMOVER COMPOSITIONS AND METHODS

John J. Berilla, Kirkwood, John H. Birk, St. Louis, John A. Caughlan, Webster Groves, and Richard H. Lalumondier, Crystal City, Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

No Drawing. Filed Nov. 15, 1967, Ser. No. 683,105

Int. Cl. C23g *5/02;* G03c *5/08*

U.S. Cl. 134—3 5 Claims

Compositions for removing photosensitive resists from silicon or aluminum substrates in photolithographic applications contain an arylsulfonic acid (toluenesulfonic acid, xylenesulfonic acid), a phenol (phenol, cresol, chlorophenol) either alone or with up to 75% by weight of the total composition of a halogenated diluent, (o-dichlorobenzene, tetrachloroethylene). An arylsulfonic acid/phenol ratio of about 1, with about 50% diulent, is preferred.

3,582,402

TECHNIQUE FOR DECONTAMINATING METAL SURFACES IN NUCLEAR REACTORS

Stanley F. Wisla, Yorktown Heights, N.Y., assignor to Atcor Inc., Hawthorne, N.Y.

No Drawing. Filed Apr. 16, 1968, Ser. No. 721,582

Int. Cl. C23g *1/06, 1/08*

U.S. Cl. 134—3 4 Claims

A technique for removing the tenacious ferrite scale formed by the flow of water coolant through the stainless steel conduits of a nuclear reactor, the technique involving the use of highly concentrated phosphoric acid at elevated temperature.

3,582,403

PROCESS FOR PREPARING ELECTRODES SUITABLE FOR ALKALINE STORAGE BATTERIES

John T. Owen, deceased, late of Bloomfield, N.J.; by Elizabeth Owen, executrix, 23 Emerson Terrace, Bloomfield, N.J. 07003

Continuation of abandoned application Ser. No. 629,329, Apr. 7, 1967. This application Jan. 6, 1970, Ser. No. 510

Int. Cl. H01m *35/18, 43/04*

U.S. Cl. 136—24 5 Claims

This disclosure describes electrodes for use in secondary battery sources and improvements in the process for making the same. It particularly relates to the preparation of nickel and cadmium electrodes. A porous plaque is impregnated with a solution of the desired metal ion and the metal ion is reacted in situ with an anion which forms a water-insoluble, heat-decomposable salt. The salt is then thermally decomposed to form the metal oxide. The disclosure also relates to the removal of nitrate ion in a porous metal substrate by reducing the nitrate with an enediol compound.

3,582,404

SOLID-STATE ELECTRICAL CELLS

Ian D. Blackburne, 71 Grevillea Road, Ashgrove, Queensland; Graeme C. Morris, 8 Ruskin St., Taringa East, Queensland; Lawrence E. Lyons, 2126 Moggill Road, Kenmore, Queensland; and Robert G. Hoare, Gowrie Private Hotel, Canberra, Australian Capital Territory, New South Wales, Australia

No Drawing. Filed Nov. 6, 1967, Ser. No. 680,950

Claims priority, application Australia, Oct. 27, 1966, 13,144/66

Int. Cl. H01m *11/00, 15/06*

U.S. Cl. 136—83 4 Claims

In a solid-state electrical cell of the type having a compressed pellet containing a charge transfer complex between two electrodes, the pellet incorporates a polar liquid, preferably water.

3,582,405

METHOD OF GENERATING ELECTRICAL ENERGY

Elihu C. Jerabek, Voorheesville, and Robert P. Hamlen, Scotia, N.Y., assignors to General Electric Company

Original application Nov. 25, 1968, Ser. No. 778,452, now Patent No. 3,532,555. Divided and this application Jan. 19, 1970, Ser. No. 3,721

Int. Cl. H01m *21/00*

U.S. Cl. 136—114 4 Claims

A method of generating electrical energy from a battery is disclosed which battery has a cathode and an anode spaced apart within a casing, an encapsulated aqueous electrolyte within the casing, and a small amount of additional free electrolyte. Upon initial cell discharge, the expansion of the anode ruptures the encapsulated electrolyte furnishing a sufficient supply of aqueous electrolyte for the remainder of the cell discharge. Loss of capacity from self-discharge is eliminated or reduced to a nominal amount since only a small amount of additional free electrolyte is present in the cell until cell discharge.

3,582,406

THERMAL TREATMENT OF ALUMINUM-MAGNESIUM ALLOY FOR IMPROVEMENT OF STRESS-CORROSION PROPERTIES

Francis P. Ford, Hamden, Conn., assignor to Olin Mathieson Chemical Corporation

No Drawing. Filed Oct. 30, 1968, Ser. No. 772,027

Int. Cl. C22f *1/04*

U.S. Cl. 148—12.7 4 Claims

A process for increasing the stress corrosion resistance of the aluminum-magnesium alloys which comprises providing an aluminum base alloy in reduced form contain-

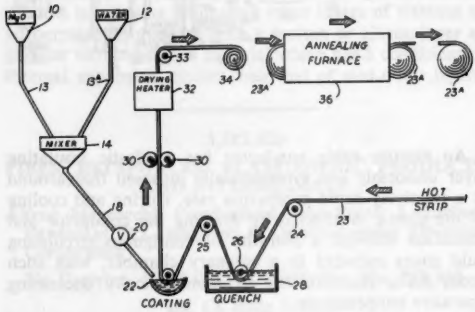
ing from 3.0% to 10.0% magnesium, balance essentially aluminum, heating said alloy at a rate of 50° F. per hour or less to a temperature of 600° to 800° F., holding said alloys at said temperature for 5 minutes to 24 hours, and cooling said alloys at a rate of 500° F. per hour or less.

3,582,407

MAGNESIUM OXIDE COATING COMPOSITION AND PROCESS FOR PRODUCING ANNEALED STEEL PUNCHING STOCK

John F. Steger and Jay W. Palmer, Crystal Lake, Ill., assignors to Morton International, Inc., Chicago, Ill.

Filed Aug. 18, 1969, Ser. No. 850,909
Int. Cl. B23b *15/04;* H01f *1/04*
U.S. Cl. 148—27 9 Claims



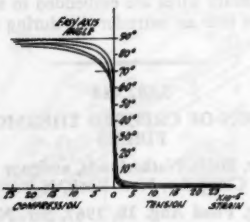
Magnesium oxide coating compositions comprising a major proportion of magnesium oxide of a surface area of from 5 to 50 square meters per gram and a minor proportion of an alkaline earth metal fluoride. The compositions are used for coatings in a process for producing annealed magnetic steel sheet wherein the coatings are applied to silicon-magnetic steel sheet, dried, and the coated steel annealed. The coatings substantially prevent the formation of hard surface and sub-surface silicates and also prevent the fusing together of the steel sheet during the annealing process.

3,582,408

MAGNETOSTRICTIVE ELEMENT

Lubomyr S. Onyshkevych, Trenton, N.J., assignor to RCA Corporation

Filed Sept. 24, 1968, Ser. No. 762,048
Int. Cl. H01f *10/02;* G11b *5/00;* G11c *11/14*
U.S. Cl. 148—31.55 7 Claims



A magnetostrictive element useful in sonic memory devices comprises a thin film of an alloy comprised of between 40 and 70 weight percent nickel, between 30 and 60 weight percent iron, and from about 0.1 to 14 weight percent manganese.

3,582,409

METHOD OF PRODUCING POTASSIUM SILICATE GLASS COATING FOR FERROUS MAGNETIC SHEET STOCK

Dale M. Kohler, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

No Drawing. Original application Jan. 2, 1968, Ser. No. 694,882, now Patent No. 3,522,113, dated July 28, 1970. Divided and this application Feb. 18, 1970, Ser. No. 12,471
Int. Cl. H01f *1/18*
U.S. Cl. 148—111 12 Claims

Methods of making potassium silicate glass coatings for silicon steel magnetic sheet stock, wherein the sheet stock, having on its surfaces a film comprising a mill glass layer, or phosphate coating layer, or layers of both, is coated with an aqueous solution of potassium silicate having a silica to potassium oxide ratio of from about 2:1 to about 2.5:1 and higher. The coated stock, in strip form, is then heated rapidly to a temperature of from about 1000° F. to about 1650° F., whereby to form on the stock a smooth, heat-resistant, protective, insulative glass having a total final thickness of from .04 mil to about .2 mil, and whereby to improve the magnetic properties of the stock.

3,582,410

PROCESS FOR PRODUCING METAL BASE SEMICONDUCTOR DEVICES

Theodore J. La Chapelle, Orange, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed July 11, 1969, Ser. No. 841,074
Int. Cl. H01l *7/34*
U.S. Cl. 148—186 10 Claims

Two single crystal semiconductor layers or one single crystal semiconductor layer and a single crystal insulating substrate are produced in juxtaposition with each other. A control layer, for example conductive or resistive, is diffused along the interface between the two layers to control the transfer of energy between the layers.

3,582,411

AERATED EXPLOSIVE SLURRY CONTAINING A FOAM PROMOTING AND VISCOSITY INCREASING AGENT AND METHOD OF MAKING SAME

Stephen M. Brockbank, 1960 East 4675 South, Salt Lake City, Utah 84117, and Robert B. Clay, Salt Lake City, Utah (827 West 3800 South, Bountiful, Utah 84010)

Filed Feb. 21, 1968, Ser. No. 707,238
Int. Cl. C06b *19/00*
U.S. Cl. 149—2 15 Claims

A method and apparatus is disclosed for preparing a slurry of variable and controllable density from a liquid solution of oxidizer, such as ammonium nitrate sensitizing particulate material. The liquid component, or part thereof, is aerated prior to adding the particulate solids to vary density and explosive characteristics of the finished slurry. Part of the liquid may be diverted through a foaming or aerating device to incorporate fine gas bubbles and then combined with other liquid and with solid ingredients to make finished slurry. The relative proportions of the various components can be changed or programmed periodically.

3,582,412

GELLED DINITROGEN TETROXIDE COMPOSITION

Charles E. Fogle, Sunnyvale, Calif., assignor to United Aircraft Corporation, East Hartford, Conn.

No Drawing. Filed Aug. 5, 1968, Ser. No. 749,965
Int. Cl. C06b *13/00*
U.S. Cl. 149—74 3 Claims

Copolymers of chlorotrifluoroethylene and vinylidene fluoride are gelling agents for dinitrogen tetroxide which

are capable of producing very viscous solutions in amounts of 10% or less by weight of the polymer. The gelled N_2O_4 is usable as the oxidizer in liquid propellant rocket motor systems.

3,582,413

BURNING RATE MODIFIERS FOR HIGH ENERGY DIFLUOROAMINO COMPOUNDS

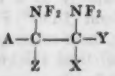
Barry D. Allan and Joseph W. Connaughton, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Feb. 15, 1963, Ser. No. 259,485

Int. Cl. C06d *5/00*

U.S. Cl. 149—109 3 Claims

1. In liquid rocket engines utilizing as a propellant component a difluoroamino derivative of the formula



wherein A, Z, X, and Y are each a member selected from the group consisting of hydrogen and lower alkyl groups of up to four carbon atoms, the total number of carbon atoms in A, Z, X, and Y not to exceed six, the improvement which comprises incorporating in said difluoroamino derivatives as a burning rate modifier a sufficient amount of a member selected from the group consisting of ferric chloride, zinc chloride, and stannous chloride to form a saturated solution thereof.

3,582,414

METHYL ALANE TERMINATED BERYLLIUM HYDRIDE LIQUIDS

Edwin F. C. Cain, Ventura, Frank D. Gunderloy, Jr., Santa Susana, Louis R. Grant, Jr., Los Angeles, and Milton Kirsch, Canoga Park, Calif., assignors to North American Aviation, Inc., El Segunda, Calif.

No Drawing. Filed Dec. 28, 1966, Ser. No. 607,132

Int. Cl. C06b *19/00;* C07f *5/06*

U.S. Cl. 149—109 4 Claims

Methyl alane terminated beryllium hydride liquids and their preparation. Gelled liquid rocket fuel compositions comprising methyl alane terminated beryllium liquids and solid beryllium hydride.

3,582,415

METHOD OF ETCHING Cu WITH USE OF Pb AND Sn LAYERS AS A MASK

Michael Gulla, Auburndale, Mass., assignor to Shipley Company, Inc., Newton, Mass.

No Drawing. Original application Oct. 22, 1966, Ser. No. 509,412. Divided and this application Jan. 9, 1969, Ser. No. 810,426

Int. Cl. C23f *1/02;* H05k *3/06*

U.S. Cl. 156—11 10 Claims

A process for plating a cupreous surface comprising first plating said surface with immersion lead and thereafter plating with immersion tin. The process is particularly applicable to the formatiion of printed circuit boards where the steps would comprise applying a negative plating resist in an image pattern over an insulating substrate having a surface of cupreous metal, the exposed area of said metal not covered by the resist defining a desired conductor pattern, providing a lead coating over the exposed metal by immersion plating, providing an immersion plating of tin over the lead, removing the plating resist and etching metal exposed by removal of the plating resist.

3,582,416

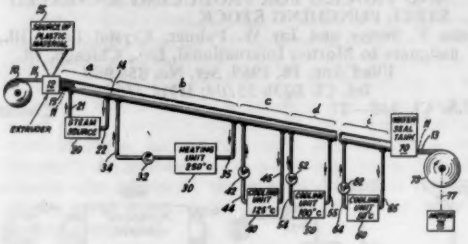
MANUFACTURE OF ELECTRIC CABLE

Edwin J. Merrell, Scarsdale, N.Y., assignor to Phelps Dodge Copper Products Corporation, New York, N.Y.

Filed Nov. 28, 1967, Ser. No. 686,004

Int. Cl. H01b *13/14*

U.S. Cl. 156—51 1 Claim



An electric cable conductor has a plastic insulating layer uniformly and symmetrically disposed therearound at a relatively rapid production rate. Curing and cooling of the plastic is effected by drawing the conductor and insulation through a plurality of contiguous circulating fluid zones included in a catenary chamber, with such zones being characterized by monotonically decreasing operative temperatures.

3,582,417

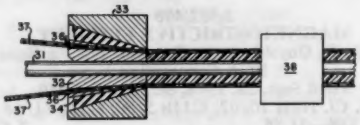
METHOD OF MAKING ELECTRIC POWER CABLE

Walter J. Plate, Rye, N.Y., and Edwin H. Arnaudin, Jr., Marion, Ind., assignors to Anaconda Wire and Cable Company

Original application Dec. 27, 1967, Ser. No. 692,893, now Patent No. 3,474,189. Divided and this application Apr. 1, 1969, Ser. No. 833,227

Int. Cl. H01b *13/14, 13/24*

U.S. Cl. 156—51 1 Claim



Undulatory drain wires are embedded in a cable jacket by paying them into an extruder die during the extrusion operation.

3,582,418

PRODUCTION OF CRIMPED THERMOPLASTIC FIBERS

Gerrit Schuur, Delft, Netherlands, assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Aug. 28, 1967, Ser. No. 663,567

Claims priority, application Netherlands, Aug. 31, 1966, 6612238

Int. Cl. B32b *31/14, 31/30*

U.S. Cl. 156—83 10 Claims

Crimped narrow strips, fibers or filaments of thermoplastic compositions are produced by stretching and slit-

ting or fibrillating multilayered films of thermoplastics consisting of coextruded layers which have significantly different stress-strain curves at identical temperatures.

3,582,419

VITREOUS OR VITROCRYSTALLINE LAMINATE PRODUCT

Jean Marchand, Alsemberg, Belgium, assignor to Glaverbel S.A., Watermael-Boitsfort, Belgium

No Drawing. Filed Apr. 22, 1968, Ser. No. 723,312

Claims priority, application Luxembourg, Aug. 30, 1967, 54,399; Great Britain, Jan. 16, 1968, 2,385/68

Int. Cl. B32b *17/06*

U.S. Cl. 156—89 9 Claims

A method of forming a vitreous or vitrocrystalline product comprising laminating outer layers of vitreous or vitrocrystalline material with a molten or plastic layer of glass or vitrocrystalline material which has a coefficient of thermal expansion greater than that of said outer layers.

3,582,420

FIBER REINFORCED ELASTOMERIC PRODUCTS AND INTERMEDIATE

Alfred Marzocchi, Cumberland, and Frank J. Lachut, Pawtucket, R.I., assignors to Owens-Corning Fiberglas Corporation

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,381

Int. Cl. B32c *5/00*

U.S. Cl. 156—179 13 Claims

The improvement in the bonding relationship between plies of elastomeric material and reinforcing fibers whereby the reactivity of the surfaces of the elastomeric material is enhanced to achieve a stronger interbonded relationship between the components by uniform distribution of short lengths of glass fibers in the elastomeric component in an amount within the range of 2½–20% by weight.

3,582,421

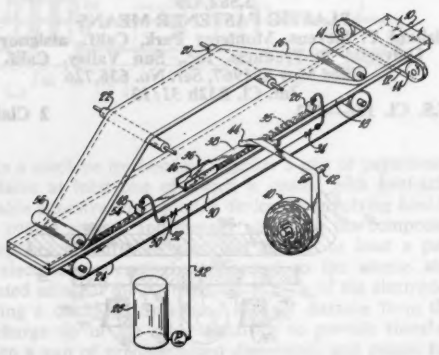
METHOD OF FORMING A ROLLED PACKAGE OF BONDED MINERAL FIBERS

John A. Arduser, Anderson, S.C., assignor to Owens-Corning Fiberglas Corporation

Filed Dec. 21, 1967, Ser. No. 692,462

Int. Cl. B31c *13/00*

U.S. Cl. 156—192 4 Claims



An insulating material of mineral fibers formed in part by splitting a low density continuous pack of bonded fibers and applying a folded splice strip along two adjacent edges of the split batt which may be rolled up at the point of manufacture in superposed relation, and may be unrolled and unfolded to a double width at the situs of use.

3,582,422

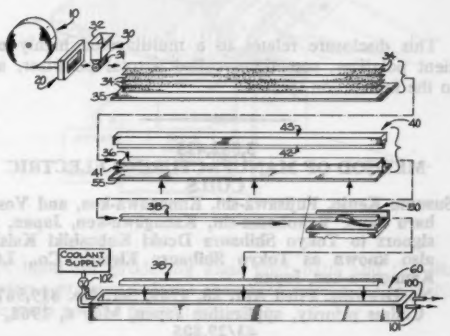
METHOD FOR FORMING BUILDING PANEL JOINTS

William Burdette Wilkins, Louisburg, N.C., assignor to Comstruct, Inc., Lincolnton, N.C.

Filed Sept. 30, 1968, Ser. No. 763,506

Int. Cl. B32b *31/20*

U.S. Cl. 156—222 6 Claims



A method and apparatus for forming sheet material into a joint member particularly adapted for assembly with facing members and a core into a prefabricated building panel and wherein strip form sheet material is supplied to apparatus including adhesive spreading means for applying adhesive to at least one surface thereof and a plurality of elongate, substantially common length, narrow width sheets are stacked with adhesive therebetween to form a layered joint blank. The layered joint blank is interposed between at least two elongate mold members supported for relative movement for bonding and shaping the layered joint blank into an elongate joint member. Subsequent to molding and bonding of the layered joint blank, the molded joint member is shaped to position elongate leg portions thereof in an inwardly biased converging relationship by insertion of the molded joint member into a postforming device, so that the inwardly biased relationship of the legs permits gripping engagement of a peripheral portion of a panel core positioned between the legs.

3,582,423

PROCESS FOR COATING POROUS SUBSTRATES

Tsu Huai Wang, Wilmington, Del., assignor to Wilmington Chemical Corporation, Wilmington, Del.

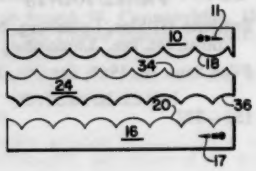
No Drawing. Filed Dec. 19, 1966, Ser. No. 602,545

Int. Cl. D06n *3/08*

U.S. Cl. 156—232 6 Claims

Coating pliable porous substrates like foams and textiles with tough pliable protective layers prepared from linear 700 to 5000 molecular weight hydrophobic dialcohols having an alcohol group at each end of the molecule which dialcohol is reacted with diisocyanate to attach free diisocyanate-carrying groups at each end, and then reacting the resultant material with slight excess of p,p'-methylene dianiline.

3,582,424
FABRICATION OF POLARIZING DEVICE
Kestutis Norvaisa, South Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Sept. 1, 1967, Ser. No. 665,073
Int. Cl. B29c 3/00
U.S. Cl. 156—244 13 Claims



This disclosure relates to a multilayered highly efficient polarizer, sometimes called a total polarizer, and to the fabrication thereof.

3,582,425
METHOD OF MANUFACTURING ELECTRIC COILS
Susumu Kenjo, Fujisawa-shi, Kanagawa-ken, and Yoshiharu Sano, Yokohama-shi, Kanagawa-ken, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, also known as Tokyo Shibaura Electric Co., Ltd., Kanagawa-ken, Japan
No Drawing. Filed Apr. 28, 1969, Ser. No. 819,987
Claims priority, application Japan, May 6, 1968, 43/29,805
Int. Cl. H01b 19/04
U.S. Cl. 156—275 4 Claims

Coils for use in electric machines and apparatus are insulated by first wrapping a self bonding mica base tape, containing a partially cured non-tacky resinous copolymer of an epoxy resin and a silicone resin, upon the coil conductor and then applying a coating of solventless resinous composition composed of an epoxy resin. The insulation thus formed is then completely cured to form an integral insulation structure. Connecting portions between coil sides are similarly insulated by successively applying layers of a self bonding mica base tape, a coating of the solventless resinous composition and a shrinkable film and then heating the assembly to completely cure the resinous compositions and to cause the shrinkable film to shrink, thus forming an integral insulation structure.

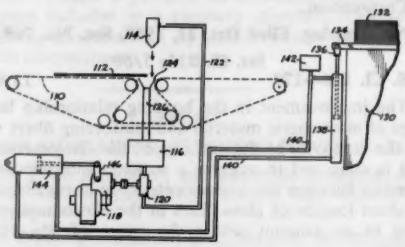
3,582,426
METHOD OF PROVIDING THE SURFACE OF AN OBJECT WITH AN ARTIFICIAL WOOD GRAIN PATTERN
Kurt Meissner, Berlin, Germany, assignor to Mikroholz Meissner & Co., KG, Berlin, Germany
Filed Mar. 28, 1968, Ser. No. 716,944
Int. Cl. B32b 31/12; B41m 3/00
U.S. Cl. 156—277 8 Claims

Means for and method of providing the surface of an object, such as a wooden, paperboard or metal panel, with a printed pattern, such as artificial wood grain. The means include an adhesive film which has a desired pattern printed on one side thereof. The method includes the steps of providing an adhesive film with a printed pattern and laminating a plastic sheet onto the surface of the object with the adhesive film.

3,582,427
POLYOLEFIN-METAL LAMINATES
Robert Bacskai, Berkeley, Calif., assignor to Chevron Research Company
No Drawing. Filed June 21, 1965, Ser. No. 465,723
Int. Cl. B32b 31/12; C09j 3/14
U.S. Cl. 156—283 3 Claims

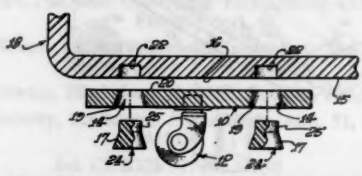
Completely nonpolar polymeric material such as polypropylene noted for inertness and poor adhesion is satisfactorily bonded to metal by applying a solid, particulate, thermoplastic polyacrylic acid to a bonding surface and joining with heat and pressure.

3,582,428
PLYWOOD MANUFACTURE WITH CONTROLLED GLUE SPREAD
Julius M. Steinberg, Hillsboro, Oreg., assignor to Pacific Adhesives Company, Inc.
Filed Apr. 17, 1969, Ser. No. 817,092
Int. Cl. B05c 11/10; B32b 31/12
U.S. Cl. 156—288 13 Claims



Plywood is manufactured by spreading with glue the surfaces of a sequence of wood veneers. The spread veneers are assembled in plywood-forming assemblies. The assemblies are stacked sequentially as they are formed. During the spreading operation the amount of glue spread is altered progressively to apply to the successive veneers the optimum spread as determined by their assembly time. The resulting stack then is pressed to consolidate the assemblies and bond together their component veneers.

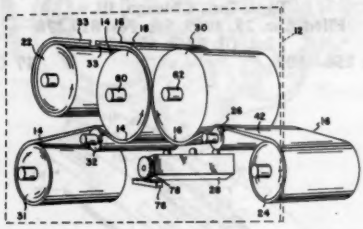
3,582,429
PLASTIC FASTENER MEANS
Richard P. Stevens, Monterey Park, Calif., assignor to Universal By-Products, Inc., Sun Valley, Calif.
Filed May 8, 1967, Ser. No. 636,726
Int. Cl. B32b 31/12
U.S. Cl. 156—293 2 Claims



A means for fastening together plastic and non-plastic members wherein an independent plastic fastener is dis-

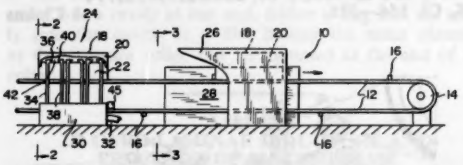
posed through the non-plastic member and affixed to the plastic member, said fastener exerting an inwardly directed holding force on said non-plastic member whereby said plastic member and said non-plastic member are retained in a predetermined relationship.

3,582,430
METHOD AND APPARATUS FOR BONDING FOAM PLASTIC TO A BACKING
Sam R. Benigno, 19 Woekel Terrace, Methuen, Mass. 01844
Filed Oct. 21, 1965, Ser. No. 500,006
Int. Cl. C09j *5/06*; B32b *31/26*
U.S. Cl. 156—322 **13 Claims**



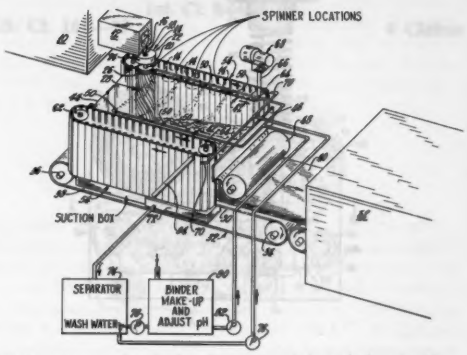
A pair of rolls are rotatable in horizontal, pressure nip, relationship. A backing web and a foam plastic web are introduced upwardly into the nip but spaced apart just below, and in advance of the nip to form an upwardly convergent throat. A heater, mounted below the nip within the throat, directs heat upwardly against the surface of the foam so that it will be bonded to the backing in the nip. The heater can be swung to also pre-heat the backing web. Suction is applied to the throat to remove the gases of combustion.

3,582,431
ELECTRICAL HEATING DEVICE
Ralph O. Vuilleumier, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.
Filed Mar. 13, 1969, Ser. No. 807,009
Int. Cl. B29c *19/02*
U.S. Cl. 156—380 **2 Claims**



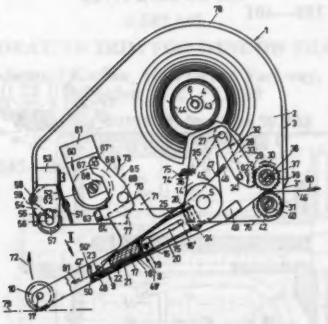
In a machine for bonding together a pair of paperboard surfaces at least one of which is coated with heat-activatable adhesive compound, a device for supplying heat to the coated surface and thereby activating the compound comprises a source of electrical energy, at least a pair of electrodes operatively connected to the source and located adjacent the coated surface, each of the electrodes having a discharge tip spaced a slight distance from the discharge tip of the other electrode to provide therebetween a gap of predetermined dimension, and means for controlling the source of energy to provide an electrical discharge across the gap and thereby supply heat to the coated surface.

3,582,432
FIBER MAT FORMING HOOD WITH MOVABLE SIDE WALLS
Arthur B. Havens, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation
Filed Apr. 1, 1969, Ser. No. 812,249
Int. Cl. B29j *5/08*
U.S. Cl. 156—381 **10 Claims**



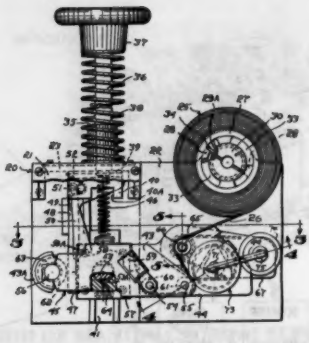
A hood for producing glass fiber batts and the like having a pressure balance chamber between the movable side walls and the product conveyor.

3,582,433
LABEL APPLYING APPARATUS
Hansjoerg Rothenberger, 9052 Niederteufen, Switzerland
Filed June 12, 1968, Ser. No. 736,344
Claims priority, application Switzerland, June 28, 1967, 9,145/67; Mar. 20, 1968, 4,172/68
Int. Cl. B32b *31/20, 31/10*
U.S. Cl. 156—384 **12 Claims**



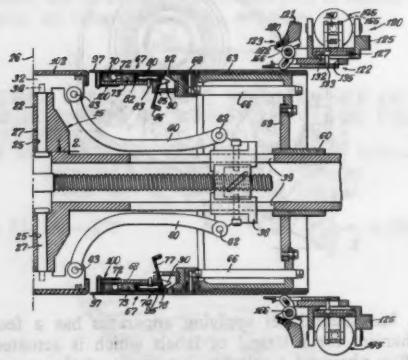
A hand-held label applying apparatus has a feeding mechanism for a strand of labels which is actuated by the first phase of a relative movement of the apparatus housing and of a lever caused when an abutment on the lever engages the object to be labeled. The feed mechanism is released in the second phase of the movement so that the fed label stops and is applied to the object with a pressure increased when friction in the feeding mechanism no longer impedes relative movement of the lever and of the housing. Many details of construction are shown.

3,582,434
TAPE APPLYING DEVICE WITH TAPE PRINTING MEANS
David G. Way, Boxborough, Mass., assignor to Tapeler Corporation, Newton, Mass.
Filed Dec. 27, 1967, Ser. No. 693,795
Int. Cl. B41m *1/36*
U.S. Cl. 156—385 3 Claims



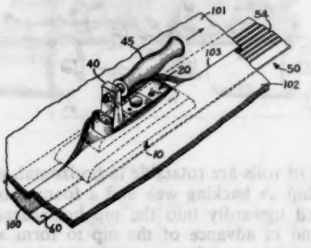
Device for applying tape, the device having a rotatable feed member, means first to turn the member to advance the tape into a predetermined position disposed towards but spaced from the surface to which the tape is to be applied and then to move the member into and out of tape-applying position, and means to effect engagement of a printing member with the tape and subsequent disengagement therefrom as functions of the operation of the first named means.

3,582,435
TIRE BUILDING APPARATUS INCLUDING MEANS FOR ENCLOSING TIRE BEADS IN TIRE CARCASS MATERIAL IN THE CONSTRUCTION OF A TIRE
Larry C. Frazier, Sun City, Ariz., assignor to National-Standard Company, Niles, Mich.
Filed Dec. 2, 1968, Ser. No. 780,435
Int. Cl. B29h *17/22*
U.S. Cl. 156—401 8 Claims



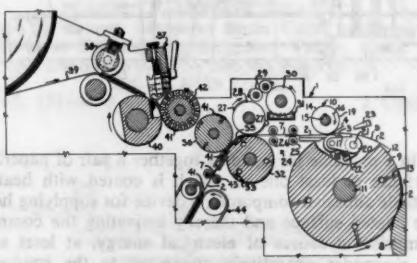
An apparatus for building pneumatic tires embodying an intermediate assembly and an end assembly at each end of the intermediate assembly for supporting tire carcass material initially in the form of a tubular cylinder, each of the end assemblies embodying tire bead shoulder forming means for displacing the tire carcass material raidally outwardly to form tire bead shoulders for engagement with tire beads held concentrically outwardly of the portions of the tire carcass material displaced to form the tire bead shoulders, ply turn-up means for encasing the tire beads at the tire bead shoulders, in which the intermediate supporting members are movable radially and circumferentially relative to each other to form the tire carcass material into substantially torous configuration, and in which the encased tire beads are supported for axial movement toward each other upon formation of the tire carcass material into substantially torous configuration.

3,582,436
CARPET SEAMING TOOL AND TAPE AND PROCEDURE FOR USING THE SAME
Emil W. Bucher, Northbrook, Ill., assignor to Sure Seam Tape, Inc., Chicago, Ill.
Filed Apr. 25, 1969, Ser. No. 819,278
Int. Cl. B65h *69/02*
U.S. Cl. 156—502 17 Claims



A carpet seaming tool in the form of a sadiron having a specially grooved bottom surface used with a densely woven tape having a ribbon of hot-melt adhesive thereon in the form of spaced longitudinal beads to provide a continuous extruded ribbon of molten adhesive for joining abutted edges of carpeting.

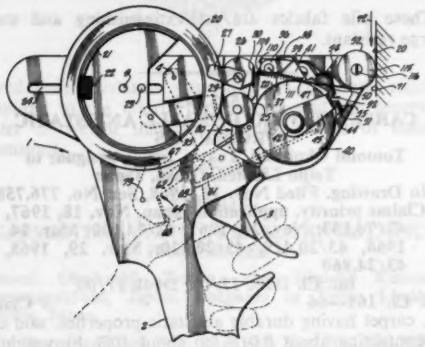
3,582,437
APPARATUS FOR THE HIGH SPEED APPLICATION OF PATCHES TO ENVELOPE BLANKS
James W. Lenk, Shawnee Mission, Kans., assignor to Berkley Machine Company, Kansas City, Mo.
Filed July 15, 1968, Ser. No. 744,938
Int. Cl. B65c *1/00*; B31b *21/14, 21/74*
U.S. Cl. 156—521 4 Claims



The surface speed of rapidly moving, spaced-apart blanks is reduced without reducing the rate of succession by decreasing the blank spacing, even to the extent of partial overlapping, while leaving the panel window area exposed, whereby rotating patch gum applicators operate

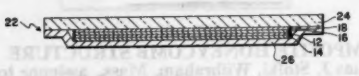
on the blanks at a conventional surface speed while other operations on the blanks may be performed in the envelope machine at higher surface speeds.

3,582,438
TAPE HANDLING TOOL
Marion E. Harbour, 2934 Arroyo Chico, Tucson, Ariz. 85716
Filed Nov. 4, 1968, Ser. No. 773,168
Int. Cl. B32b *31/20*; B44c *7/02*
U.S. Cl. 156—523 25 Claims



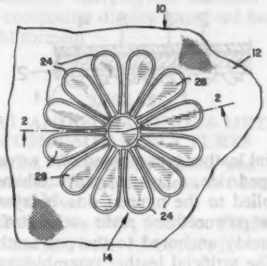
A hand-held tool capable of either applying or dispensing tape. When a trigger is pulled as far as possible by the user, it actuates a cutting mechanism and a tape dispensing mechanism on alternate excursions. By pulling the trigger only part way, the dispensing operation can be repeated indefinitely without intervention of the cutting operation. The trigger has a rotatable dog, the position of which determines which mechanism the trigger actuates when it is pulled. An alternator that is controlled by movement of the trigger changes the position of the dog. The cutting mechanism comprises two movable blades, means for moving the tape away from the blades as it is cut, and a brake all actuated by the trigger. The brake creates a drag on the tape so it can be tensioned. The tape is threaded between an idler roller and a payout wheel. A hub for rotatably supporting a tape roll is translatable in the direction of the idler roller, and the lateral position of the tape roll on the hub is adjustable. The pressure roller has a cavity at one end. Either a slug that fits snugly into the cavity or a disc having the same diameter as the pressure roller can be mounted at the end of the roller.

3,582,439
ID CARD LAMINAR STRUCTURE AND PROCESSES OF MAKING SAME
James F. Thomas, Lawrence, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Apr. 1, 1968, Ser. No. 717,732
Int. Cl. B32b *27/04*; G03c *5/59*; G09f *3/02*
U.S. Cl. 161—5 20 Claims



Laminar structures comprising a color photograph bonded to a sheet of vinyl through an ethylene-vinyl acetate copolymer tie coat and identification (ID) cards including the same.

3,582,440
SIMULATED HAND-EMBROIDERED MATERIAL AND METHOD OF MAKING SAME
Milton Kukoff, 30 Irma Drive, Oceanside, N.Y. 11572
Filed May 20, 1968, Ser. No. 730,388
Int. Cl. B44f *7/00*
U.S. Cl. 161—19 4 Claims



The present invention relates to a fabric which has disposed thereon independent design areas. Each design area, which may take any desired shape, gives the general appearance and sensory impression of a design having raised border therearound imitating the hand embroidery impression. The method generally, of obtaining this hand embroidery look requires that a basic design be applied usually colored through an application means or other appropriate design applicator using a thinned polyvinyl chloride composition. A second silk screen is used to apply a thick layer of polyvinyl chloride at the border of the basic design or within said design and thereafter the combination is subjected to a heating process thereby creating a design having a raised border effect in the style and appearance of a hand-embroidered design.

3,582,441
DECORATIVE TRIM FOR WINDOW SHADES
Samuel Guffan, 1488 Ocean Parkway, Brooklyn, N.Y. 11230
Filed May 20, 1970, Ser. No. 38,933
Int. Cl. B32b *3/04*, *7/06*
U.S. Cl. 161—39 5 Claims

A transparent plastic film or sheet carrying an ornamental design on the obverse side, a pressure sensitive adhesive along the longitudinally extending edges of the obverse side and an ornamental design on the reverse side to mask the adhesive from view, is used as decorative trim when attached to the bottom of a window shade. When attached to the window shade, the obverse side of the plastic film or sheet faces the window shade and is protected from damage.

3,582,442

ARTIFICIAL LEATHER HAVING A POLYPEPTIDE FILM AS THE SURFACE LAYER

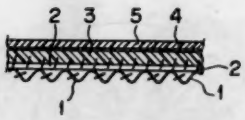
Tadayo Kaneko, Tokyo, Japan, assignor to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jan. 30, 1968, Ser. No. 701,578

Claims priority, application Japan, Jan. 31, 1967, 42/8,040; May 27, 1967, 42/33,369

Int. Cl. D06n *3/04, 3/18*

U.S. Cl. 161—53 6 Claims



The artificial leather is composed of a woven base fabric having a napped side, a layer of polyurethane resin which has been applied to the napped side, a layer of a binder applied to the polyurethane resin and a surface film of a poly(amino acid) anchored to the polyurethane resin by the binder. The artificial leather resembles natural leather in appearance and touch, has excellent characteristics of moisture permeability, heat resistance, and mechanical strength and may be used like natural leather.

3,582,443

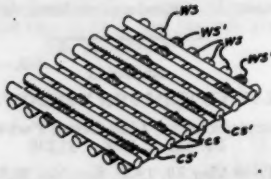
NON-WOVEN FABRICS

Hollis H. Bascom, Livermore, Calif., assignor to Orcon Corporation, Livermore, Calif.

Original application May 20, 1963, Ser. No. 281,421, now Patent No. 3,391,043, dated July 2, 1968. Divided and this application Dec. 8, 1967, Ser. No. 701,801

Int. Cl. B32b *5/12*

U.S. Cl. 161—57 2 Claims



Non-woven fabrics have a small amount of adhesive located on only selected strands to produce light weight but high strength fabrics.

3,582,444

SELF-EXTINGUISHING AND STATIC CHARGE RESISTANT PILE FABRIC

Reginald M. Ngo, Newport News, and Worth G. Kirkman, Williamsburg, Va., and Charles E. Lowry, Amsterdam, Netherlands, assignors to The Dow Chemical Company, Midland, Mich.

Filed May 1, 1967, Ser. No. 635,014

Int. Cl. D03d *27/00*

U.S. Cl. 161—65 7 Claims

A pile fabric comprising:

(A) a backing material and,

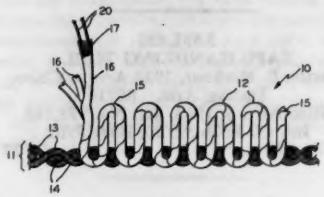
(B) pile loops anchored in said backing material, said pile loops comprising:

(1) a flammable fiber and,

(2) a metallic laminate thread comprising:

(a) a self-supporting metal ply and,

(b) a polymeric ply bonded to the metal ply.



These pile fabrics are self-extinguishing and static charge resistant.

3,582,445

CARPET HAVING DURABLE ANTISTATIC PROPERTIES

Tomomi Okuhashi, Tokyo, Japan, assignor to Teijin Limited, Osaka, Japan

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,758

Claims priority, application Japan, Nov. 18, 1967, 42/74,133; Nov. 20, 1967, 42/74,600; Mar. 14, 1968, 43/20,419, 43/20,420; Mar. 29, 1968, 43/24,860

Int. Cl. D05c *17/02;* D04h *11/00*

U.S. Cl. 161—66 9 Claims

A carpet having durable antistatic properties, said carpet containing about 0.01% to about 10% by weight of an electrically conductive fiber in its surface structure, characterized in that said electrically conductive fiber comprises a substrate of chemical fiber and an electrically conductive coating formed thereon, said electrically conductive fiber having the functional properties of textile fibers.

3,582,446

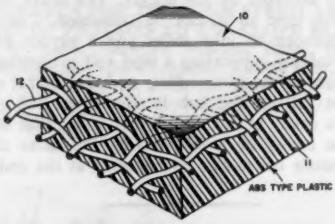
COLD-FORMABLE SHEET-LIKE COMPOSITE

Thomas J. Stolki, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 23, 1969, Ser. No. 827,233

Int. Cl. B32b *27/12;* C08f *15/00*

U.S. Cl. 161—89 8 Claims



Composites which utilize a matrix layer of a rubber modified interpolymer system of monovinyl aromatic compound in which is embedded an interlayer of metallic filamentous material having a generally regular and recurring pattern. The composites display improved heat resistance and can be cold formed into articles of manufacture by sheet-metal working procedures.

3,582,447

COMPOSITE HONEYCOMB STRUCTURE

Thomas J. Stolki, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

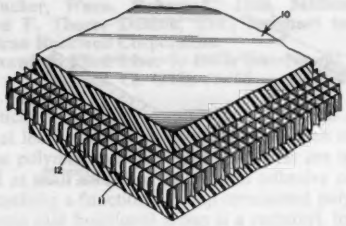
Filed May 23, 1969, Ser. No. 827,393

Int. Cl. B32b *3/12*

U.S. Cl. 161—68 5 Claims

Composites which utilize a matrix layer of a rubber-modified interpolymer system of monovinyl aromatic

compound in which is embedded an interlayer having a honeycomb structure and composed of metal or rigid organic polymeric material. The composites display improved heat resistance, structural integrity, and rigidity compared to the matrix layer alone, and are generally lighter in weight than all metallic panels of similar dimensions.



3,582,448

GARMENTS HAVING DURABLE ANTISTATIC PROPERTIES

Tomomi Okuhashi, Tokyo, and Kinichi Kumura, Amagasaki-shi, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Feb. 19, 1969, Ser. No. 800,769

Claims priority, application Japan, Apr. 23, 1968, 43/33,281; June 18, 1968, 43/51,394; July 27, 1968, 43/64,373; Sept. 25, 1968, 43/83,122

Int. Cl. B32b *5/16, 27/20*

U.S. Cl. 161—87 6 Claims

A garment having durable antistatic properties and comprising an outside fabric and a lining or interlining fibrous material, at least a part of which contains at least about 0.01% by weight of an electrically conductive fiber, said electrically conductive fiber comprising a substrate of chemical fiber and an electrically conductive coating thereon, and said electrically conductive fiber having the functional properties of textile fibers.

3,582,449

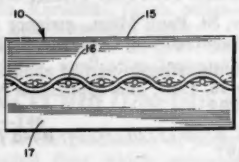
COLD-FORMABLE SHEET-LIKE COMPOSITE

Thomas J. Stolki, Wilbraham, Mass., and Thor J. G. Lonning, Suffield, Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed June 10, 1969, Ser. No. 831,892

Int. Cl. B32b *27/12;* C08f *15/00*

U.S. Cl. 161—89 7 Claims



Composites which utilize an interlayer of metal between a sheet of graft copolymer of monovinyl aromatic compound on an elastomer and a sheet of monovinyl aromatic compound/elastomer interpolymer modified vinyl halide polymer. The composites display improved heat resistance and can be cold formed.

3,582,450

VINYL AND FORAMINOUS METAL COMPOSITE STRUCTURES

Thomas J. Stolki, Wilbraham, Mass., and Thor J. G. Lonning, Suffield, Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed June 10, 1969, Ser. No. 831,893

Int. Cl. B32b *15/08, 27/30*

U.S. Cl. 161—89 6 Claims

Composites which utilize an interlayer of metal between a sheet of graft copolymer of monovinyl aromatic compound on an elastomer and a sheet of monovinyl aromatic compound/elastomer interpolymer modified vinyl halide polymer. The composites display improved heat resistance and can be cold formed.

3,582,451

VINYL AND FORAMINOUS METAL COMPOSITE STRUCTURES

Thomas J. Stolki, Wilbraham, Mass., and Thor J. G. Lonning, Suffield, Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed June 10, 1969, Ser. No. 831,894

Int. Cl. B32b *15/08, 27/30*

U.S. Cl. 161—89 8 Claims

Composites which utilize an interlayer of metal laminated between a pair of modified vinyl halide polymer sheets. The composites display improved heat resistance and can be cold formed.

3,582,452

SELF-ADHERING FLEXIBLE METALLIC ARTICLE

William Thomas Britton, Columbus, Ohio, assignor to Borden, Inc.

No Drawing. Filed Mar. 28, 1967, Ser. No. 626,429

Int. Cl. C09j *7/04;* B32b *15/14*

U.S. Cl. 161—97 5 Claims

The invention comprises a self-adhering, flexible metallic laminate consisting of a flexible non-metallic substrate which may be cloth, paper or a synethetic resin film: an adhesive disposed on the first surface of the substrate; a metallic sheet bonded to said substrate by means of said adhesive; a pressure sensitive adhesive on the second sheet of said substrate and a rotogravure decorative pattern on the exposed surface of the metal sheet.

3,582,453

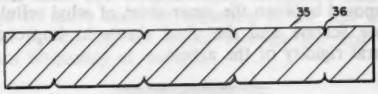
GROOVED STRAPPING

William Henry Sloan, Vienna, W. Va., and Howard Warner Starkweather, Jr., Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 7, 1969, Ser. No. 822,424

Int. Cl. B32b *3/00;* B65d *63/00*

U.S. Cl. 161—123 7 Claims



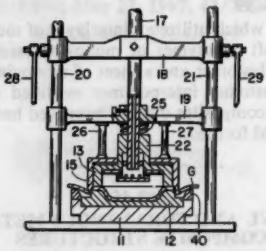
A highly oriented strapping having a series of longitudinal grooves which causes the strapping to split along the grooves rather than across the width of the strapping thereby preventing breaking of the strapping from tearing across the entire width when partially cut under tension, and a multi-step roll orienting process for fabricating such strapping in which the final pair of orienting rolls also form the grooves.

3,582,454

GLASS ARTICLE FORMING AND TRIMMING

James W. Giffen, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 4, 1968, Ser. No. 773,265
Int. Cl. C03b 9/46, 23/02
U.S. Cl. 161—149 5 Claims



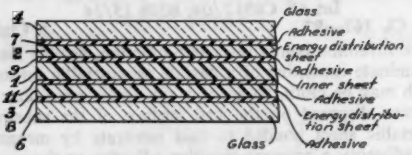
Composite sheet glass having a central stratum and outer stratums is trimmed by forcing an outer stratum over the central stratum to produce a trimmed edge which is virtually encased by the outer stratums.

3,582,455

LAMINATED SAFETY GLASS

Robert A. De Lap, Midland, and Frank P. Esch, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed June 20, 1968, Ser. No. 738,383
Int. Cl. B32b 17/10; C03c 27/12
U.S. Cl. 161—165 5 Claims



A laminated article comprising two sheets of glass and an inner sheet disposed therebetween of a substantially water insoluble alkyl ether of cellulose such as ethyl cellulose or an organic acid ester of cellulose such as cellulose acetate is prepared by applying an adhesive such as a latex of a copolymer of ethylene and acrylic acid to the mating surfaces of the inner sheet and the glass sheets and then bringing the sheets together and applying heat and pressure until a bond is formed between the several sheets. In an alternative embodiment, energy distribution sheets fabricated of, for example, an ionic copolymer are disposed between the inner sheet of ethyl cellulose or cellulose acetate and the glass sheets to improved the structural rigidity of the article.

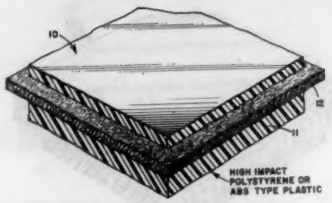
3,582,456

COLD-FORMABLE COMPOSITES

Thomas J. Stolki, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 23, 1969, Ser. No. 827,273
Int. Cl. B32b 5/16, 15/08
U.S. Cl. 161—165 5 Claims

Composites which utilize a matrix layer of a rubber-modified interpolymer system of monovinyl aromatic compound in which is embedded an interlayer of metallic filamentous material having a generally random pattern. The composites display improved heat resistance and may



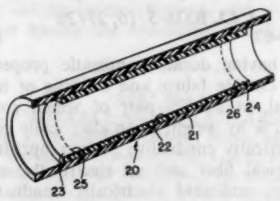
be cold-formed into articles of manufacture by sheet-metal working procedures.

3,582,457

HEAT SHRINKABLE COMPONENTS WITH MELTABLE INSERT LINER

Frank E. Barthell, Dracut, Mass., assignor to Electronized Chemicals Corporation, Burlington, Mass.

Filed Dec. 19, 1967, Ser. No. 691,791
Int. Cl. B32b 31/28; H02g 3/06
U.S. Cl. 161—166 6 Claims



A heat deformable device comprising an outer, heat shrinkable, self deformable layer containing an insert liner which will, in the presence of the deforming heat, melt and fuse to articles telescoped in the device and which contains an integral treated region which prevents the extrusion of the melted fluid material from between the deformable outer layer and the telescoped article.

3,582,458

POLYIMIDE COMPOSITIONS AND METALLIC ARTICLES COATED THEREWITH

James R. Haller, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 648,945, June 26, 1967. This application Nov. 12, 1968, Ser. No. 775,204
Int. Cl. B32b 15/20, 27/34; B44d 1/18
U.S. Cl. 161—197 17 Claims

Polymer-metal laminate composites having improved adhesion between metallic and polymer laminae, the polymer consisting essentially of a mixture of a polyimide and a polyimide containing amide groups along the backbone of the polymer chain; and compositions adapted to making such laminates, containing the said polymer mixture in solution in a suitable solvent.

3,582,459

ETHYLENE-PROPYLENE POLYMER LAMINANT ADHERED BY A POLYBUTADIENE CARBOXY TERMINATED ADHESIVE AND A POLYFUNCTIONAL IMINE CURING AGENT

Jerry Tucker, Waco, Robert L. Hall, Midland, and Millard F. Thorp, Denton, Tex., assignors to North American Rockwell Corporation

No Drawing. Filed Mar. 7, 1968, Ser. No. 711,176
Int. Cl. G32b *15/08*
U.S. Cl. 161—217 7 Claims

An article of manufacture having at least two surfaces wherein at least one of the surfaces comprises an ethylene-propylene polymer and wherein the surfaces are intimately joined at their interface by a cured adhesive composition comprising a functional group terminated polybutadiene wherein said functional group is a carboxyl, hydroxyl, amine, mercapto or isocyanate group cured with a polyfunctional imine which is nitrilotriethylbeta-propyleniminobutyrate or nitrilotriethyl-beta-ethyleneiminobutyrate. The adhesive composition may contain a reinforcing agent such as acetylene black or carbon black.

3,582,460

IMPROVING THE FREENESS OF ASBESTOS BY TREATMENT WITH SILICA SOL

Solomon George Lipsett, Montreal, Quebec, Canada, assignor to Asbestos Corporation Limited, Quebec, Canada

Continuation of application Ser. No. 599,295, Dec. 5, 1966. This application Feb. 20, 1970, Ser. No. 16,636
Claims priority, application Canada, Dec. 8, 1965, 947,343
Int. Cl. C03b *37/00*
U.S. Cl. 162—3 6 Claims

Asbestos fibers are treated, as described, with aqueous silica sols, then dried. The treatment greatly increases the freeness of the fibers and is a valuable help in filtering compositions containing asbestos.

3,582,461

PITCH CONTROL IN PULP AND PAPERMAKING PROCESSES

Stanley A. Lipowski, Livingston, and James F. Hern, Newark, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed Feb. 14, 1968, Ser. No. 705,298
Int. Cl. D21h *3/52*
U.S. Cl. 162—72 7 Claims

Water soluble dicyandiamide-formaldehyde condensates are used in controlling the pitch which forms during pulp and papermaking processes. A condensate which is the reaction product of dicyandiamide and formaldehyde is effective in controlling the pitch which is liberated during pulp and papermaking processes.

3,582,462

PROCESS FOR PRODUCTION OF PAPER OF POLYVINYL ALCOHOL SYNTHETIC FIBERS

Tadao Ashikaga, Kurashiki, Unpei Maeda, Soji, and Koji Tanaka, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Japan

No Drawing. Filed Apr. 15, 1969, Ser. No. 816,413
Claims priority, application Japan, Apr. 19, 1968, 43/26,308
Int. Cl. D21f *11/00;* D21h *5/12*
U.S. Cl. 162—146 6 Claims

A process for the production of paper consisting of a polyvinyl alcohol fiber which comprises disintegrating staple fibers of water-insoluble polyvinyl alcohol and staple fibers of hot water soluble polyvinyl alcohol in water and thereafter making a slurry of said fibers into paper, characterized in that prior to said papermaking step, said polyvinyl alcohol fibers are treated with a water repellent selected from the group consisting of silicone water repellents, complexes of higher fatty acids and metal chlorides, alkyl ketene dimers, methylol amides of higher fatty acids and cationic surface active agents.

3,582,463

METHOD OF INHIBITING THE GROWTH OF SLIME IN PAPER MILL WATER SYSTEMS WITH DIHALOPROPIONALDEHYDES AND COMPOSITIONS THEREFOR

Arthur Schwerdle, Vineland, N.J., assignor to Vineland Chemical Company, Vineland, N.J.

No Drawing. Filed July 18, 1968, Ser. No. 745,662
Int. Cl. D21h *5/22*
U.S. Cl. 162—161 19 Claims

A method for inhibiting the formation and growth of slime in paper mill water systems involving the use of 2,3-dichloropropionaldehyde or 2,3-dibromopropionaldehyde. Preferred compositions for such use comprising, in addition to the dihalopropionaldehyde, a stabilizer such as epichlorhydrin, and/or a supplemental biocide such as 1,4-bis-bromacetoxy-2-butene or 1,4-bis-bromacetoxy-2-butyne are also provided introduced to said paper mill water system in an amount between 0.25 ounce and 1 pound per ton of paper produced.

3,582,464

AQUEOUS DISPERSIONS OF ROSIN ANHYDRIDE AND THEIR USE AS SIZING AGENTS FOR PAPER

Paul H. Aldrich, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Apr. 10, 1967, Ser. No. 629,398
Int. Cl. C08h *11/04;* D21h *3/34*
U.S. Cl. 162—180 16 Claims

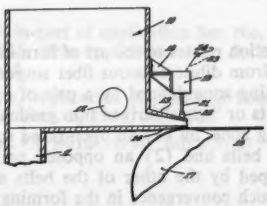
Aqueous dispersions of rosin anhydride, having utility as sizing agents for paper, are prepared. The rosin anhydride is prepared by reaction of rosin and acetic anhydride.

3,582,465

STOCK INLET METHOD AND APPARATUS

Salomon M. Salomon, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 8, 1968, Ser. No. 719,476
Int. Cl. D21f *1/02*
U.S. Cl. 162—212 7 Claims



The method and apparatus for applying high frequency vibrations on the slice lips of a paper machine for example so as to obtain improved smooth flow of the paper stock from the slice. The vibration may be applied directly to the lips to move them or vibration of the lips may be induced by driving the liquid through the lips at the resonant frequency of the lips.

3,582,466

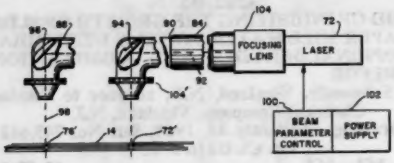
PAPER WEB SLITTER APPARATUS INCLUDING A LASER AND LIGHT TRANSMISSIVE STRUCTURE

Harrison P. Quirk, 1942 Roosevelt, Ypsilanti, Mich. 48197

Filed July 9, 1968, Ser. No. 743,495
Int. Cl. B26f *1/30*
U.S. Cl. 162—286 2 Claims

This specification discloses a system for longitudinally slitting, or trimming to width, a continuous, longitudinally

moving web of paper. One or more laser output beams are utilized by means of periscope-like light transmissive and



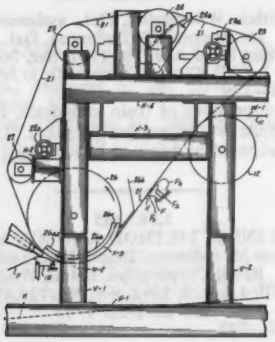
focusing structure extending transversely over the web to part the sheet as the latter tranverses the fixed path of the focused beam.

3,582,467

TWO WIRE FORMER

David R. Gustafson and John F. Schmaeng, Rockton, Ill., and John S. Finnila, Kent, Wash., assignors to Beloit Corporation, Beloit, Wis.

Filed June 25, 1968, Ser. No. 739,796
Int. Cl. D21f *1/00*
U.S. Cl. 162—303 14 Claims



The invention relates to the art of forming fibrous webs e.g., paper from dilute aqueous fiber suspensions fed into a web forming zone defined by a pair of opposed porous forming belts or "wires" driven into gradual convergence, in a forming zone, by (1) an open-faced roll wrapped by one of the belts and (2) an opposed porous stationary guide wrapped by the other of the belts and urging the same into such convergence in the forming zone with the one belt, the stationary guide presenting a non-circular active surface defined by the longitudinal contour of a plurality of belt-contacting longitudinally spaced transverse edges.

3,582,468

RECOVERY OF DOUBLE-STRANDED RIBONUCLEIC ACID

Jerome Birnbaum, Morganville, N.J., and George P. Lampson, Hatfield, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Sept. 27, 1968, Ser. No. 763,399
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 6 Claims

Double-stranded ribonucleic acids (DS-RNA) are recovered from a fermentation broth which involves adding a proteolytic enzyme, which will not attack nucleic acid, to destroy the interface formed by subsequent phenol extraction. Also, a quaternary ammonium compound including a cetyl radical is used to precipitate the DS-RNA. Additionally, purification is achieved by chromatography using hydroxylapatite.

3,582,469

PRODUCTION OF DOUBLE-STRANDED RIBONUCLEIC ACID

Jerome Birnbaum, Morganville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Sept. 27, 1968, Ser. No. 763,408
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 6 Claims

Double-stranded ribonucleic acid is produced by *Escherichia coli* cells infected with the MU-9 mutant of MS2 coliphage and the specific productivity is increased by the timely addition of an antibiotic post-infection.

3,582,470

METHOD OF PRODUCING 5-AMINO-4-IMIDAZOLECARBOXAMIDE RIBOFURANOSIDE BY FERMENTATION

Haruo Tsuri, Koichi Takinami, and Teruo Shiro, Kanagawa-ken, and Hiroshi Okada, Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Continuation of application Ser. No. 554,319, June 1, 1966. This application July 10, 1969, Ser. No. 859,524
Claims priority, application Japan, June 12, 1965, 40/34,862
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 7 Claims

The yield of AICAR by fermentation of otherwise conventional culture media by means of certain strains of *Bacillus subtilis* and *Bacillus megaterium* is sharply increased when the media are neutralized by means of gaseous ammonia and contain more than 10 mg./dl. magnesium ions.

3,582,471

METHOD OF PRODUCING THREONINE BY FERMENTATION

Isamu Shiio, Kamakura-shi, and Shigeru Nakamori and Kounosuke Sano, Kawasaki-shi, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed June 26, 1968, Ser. No. 740,026
Claims priority, application Japan, July 3, 1967, 42/42,733
Int. Cl. C12b *1/00*
U.S. Cl. 195—30 3 Claims

Producing L-threonine with strains of *Brevibacterium flavum* and *Corynebacterium acetoacidophilum* which are resistant to α-amino-β-hydroxyvaleric acid in a conventional culture medium substantially free of L-homoserine.

3,582,472

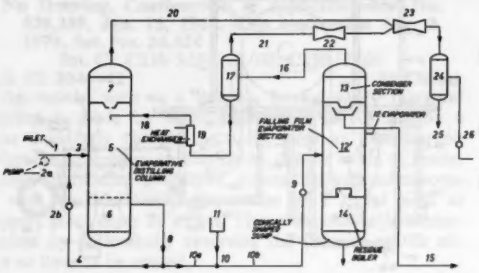
PLURAL STAGE VACUUM DISTILLATION APPARATUS FOR CONTINUOUS PURIFICATION AND CONCENTRATION OF GLYCERINE

Peter Franz, Mumpf, Switzerland, assignor to Buss AG, Basel, Switzerland

Filed Dec. 11, 1968, Ser. No. 782,878
Claims priority, application Switzerland, Dec. 21, 1967, 18,144/67
Int. Cl. C07c *29/26*
U.S. Cl. 202—154 3 Claims

The present invention relates to a process for the continuous purification and concentration of glycerine and

to an apparatus for the application of this process. In the process crude glycerine is transported under pressure into a recycling evaporative distilling column for concentration and a portion of the concentrated glycerine is treated with



an alkaline substance, after which it is processed in an evaporator tower embodying a falling film evaporator and is finally separated off by a condenser in a condition of high purity.

3,582,473

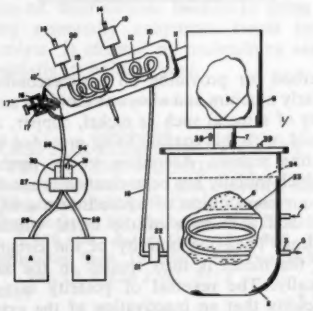
METHOD FOR WATER DISTILLATION

William A. Barnstead, 311 Appleton St., Arlington, Mass. 02174

Continuation-in-part of application Ser. No. 563,302, July 6, 1966, which is a continuation-in-part of application Ser. No. 280,199, May 14, 1963. This application Mar. 7, 1968, Ser. No. 719,817

Int. Cl. B01d *5/00*; C02b *3/00*

U.S. Cl. 203—11 8 Claims



A method of distilling water is disclosed to provide distillate having a purity of the order of 2 million ohm-cm. resistance and above from tap water. The method is particularly directed to prevent gases, as CO_2, NH_3, SO_2 etc., which are generally present in tap water or are extracted from the surrounding atmosphere during the condensing stage in the usual distillation process, from dissolving in the distillate during condensation. To accomplish the desired results the condensing stage disclosed contemplates condensing the water vapor in a vented condenser at a temperature above the environmental boiling point of water with a corresponding pressure above environmental pressure thereby to maintain the flow of gases outward from the condenser and, further, to pevent the unwanted gases from dissolving in the condensate.

3,582,474

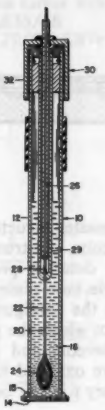
METHOD AND APPARATUS FOR MEASURING POTASSIUM ION ACTIVITY

Michael L. Hair, Corning, N.Y., and Inci Altug, Bloomington, Ind., assignors to Corning Glass Works, Corning, N.Y.

Filed Sept. 18, 1968, Ser. No. 760,608

Int. Cl. G01n *27/46*

U.S. Cl. 204—1 3 Claims



An electrochemical apparatus for selectively determining the activity of potassium ions in an aqueous solution.

3,582,475

METHOD AND APPARATUS FOR THE INTRODUCTION OF SAMPLES INTO CHROMATOGRAPHIC SEPARATING SYSTEMS

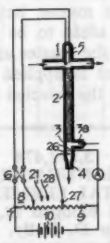
Victor Pretorius, "Klein Waterkloof" Club Ave., Waterkloof, Pretoria, Transvaal, Republic of South Africa, and Hans Helmut Hahn, 38 Marais St., Bailey's Muckleneuk, Pretoria, Transvaal, Republic of South Africa

Continuation-in-part of application Ser. No. 583,788, Oct. 3, 1966. This application Aug. 2, 1967, Ser. No. 657,814

Claims priority, application Republic of South Africa, Aug. 2, 1966, 66/4,568

Int. Cl. B01d *59/40*; B01k *5/00*

U.S. Cl. 204—1 21 Claims



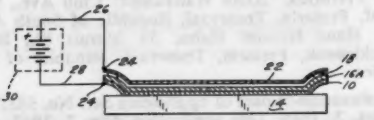
The solutes of a sample to be separated chromatographically are first plated onto an electrode. This electrode is then maintained in the inlet of a chromatographic system where by reversal of the current the sample is returned to solution. By controlling the size of the electrode and the time taken for the sample to return to solution, the

plate height contribution of the inlet is limited. A preliminary partial separation of the sample by electrolytic means is also provided for.

3,582,476
METHOD OF PRODUCING PRODUCTS BY PLATING
Bill C. Knisley, San Diego, Calif., assignor to Stromberg Datagraphics, Inc., San Diego, Calif.
Filed May 10, 1967, Ser. No. 637,505
Int. Cl. B01k *1/00*; C23b *7/00*
U.S. Cl. 204—11 **5 Claims**

A method and master structure for producing circuit patterns, micro circuits, electron beam shaping matrices, and similar highly detailed products made by plating, wherein an oxidizible base plate supports a platable layer which is formed in the configuration of the product and is of a material from which the product may be separated after it is plated thereon, and wherein exposed surfaces on the base plate are oxidized to render them electrically nonconductive so they will not be plated.

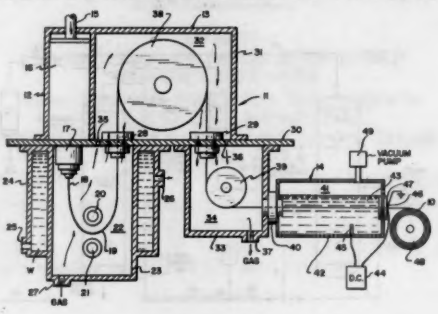
3,582,477
SELECTIVE ELECTROPLATING METHOD
Paul Gelb, 43—23 Colden St., Flushing, N.Y. 11355
Filed Feb. 20, 1969, Ser. No. 800,865
Int. Cl. B44c *1/04*; C23b *5/70*
U.S. Cl. 204—18 **3 Claims**



A method of selectively plating a layer of metal from a solution of electrolyte onto predetermined areas of an electrically conductive member which functions as a cathode. A formed, cathodic, and electrically conductive master is placed on the surface of the member to be selectively plated, the master having exposed portions corresponding to the areas to be selectively plated. An anode is spaced from the master and the cathode and an electric plating current is applied between the cathode and the anode so that the selected areas are plated.

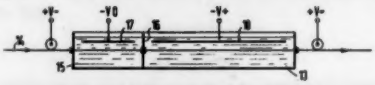
3,582,478
METHOD OF MANUFACTURING PLATED METAL ELEMENTS
William D. Kelly, 12 Blodgett St., Clarendon Hills, Ill. 60514, and William D. Kelly, Jr., 1000 Waiola, La Grange, Ill. 60525
Filed Nov. 14, 1968, Ser. No. 775,706
Int. Cl. B21c *23/22*; B23b *17/00*; C23b *5/58*
U.S. Cl. 204—28 **14 Claims**

A method of manufacturing plated metal elements including the steps of extruding an element into an inert atmosphere, working the metal element as by drawing the same while maintaining it in an inert atmosphere to prevent chemical changes of the surface material thereof,



and plating the element directly as it is delivered from the inert atmosphere.

3,582,479
METHOD FOR PROVIDING ON NIOBIUM OR NIOBIUM-ZIRCONIUM ALLOYS METAL COATINGS BY GALVANIC ETCH-PLATING
Gerd Urban and Erwin Schmidt, Erlangen, Germany, assignors to Siemens Aktiengesellschaft
Filed Nov. 20, 1968, Ser. No. 777,443
Claims priority, application Germany, Dec. 8, 1967, P 16 21 177.1
Int. Cl. C23b *1/00, 5/00, 5/58*
U.S. Cl. 204—32 **14 Claims**



A method for providing on a superconductive metal, particularly niobium and alloys of niobium and zirconium, a coating of a metal such as nickel, copper, zinc, indium, tin or gold, with this coating being provided by a galvanic etch-plating process. According to the method the base metal which initially has been cleaned is anodically etched in an aqueous solution of hydrofluoric acid, ammonium fluoride, and a fluoride of the metal which is to form the coating. Then the polarity of the circuit is reversed so that the metal is then treated in the same solution cathodically. The reversal of polarity takes place with such rapidity that an inactivation of the exterior surface of the base metal cannot occur.

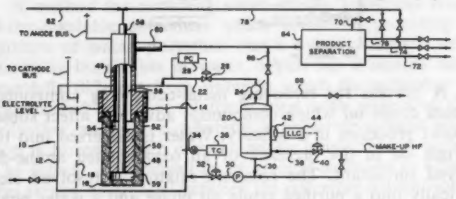
3,582,480
HEAT TREATING PROCESS FOR IMPROVING HIGH TEMPERATURE DUCTILITY OF ELECTRODEPOSITED NI AND NI ALLOYS
Juan Chorne, Dublin, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed June 2, 1969, Ser. No. 829,215
Int. Cl. C23b *5/52*
U.S. Cl. 204—37R **3 Claims**

A heat treating process for eliminating high temperature embrittlement intrinsic to electroplated nickel. The treatment is carried out in a vacuum for periods of twenty hours or more and at temperatures between 1000°–1250° C.

3,582,481
METHOD OF APPLICATION OF DRY LUBRICANT TO SURFACE OF AN ARTICLE
Ralph J. Hovey, Glen Ellyn, and Afsar A. Khan, Chicago, Ill., assignors to The Bunker-Ramo Corporation, Broadview, Ill.
No Drawing. Continuation of application Ser. No. 520,359, Jan. 13, 1966. This application Apr. 3, 1970, Ser. No. 24,424
Int. Cl. C23b 5/50, 13/00; C23f 17/00
U.S. Cl. 204—42 10 Claims

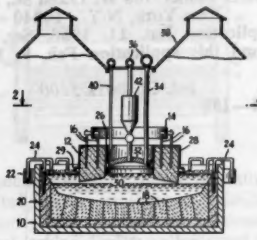
An article, such as a bearing, having a dry lubricant coating is made by electrophoretically depositing on a base negatively charged particles, such as fluorocarbon polymers, molybdenum disulphide, copper oxide or resins, having lubricating properties, substantially simultaneously with the electrolytic deposition of a metal such as copper, gold, silver or nickel. This codeposition is accomplished by periodically reversing the polarity of the object or base to be coated.

3,582,482
TEMPERATURE CONTROL IN ELECTROCHEMICAL FLUORINATION PROCESSES
Lyle W. Pollock, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Oct. 7, 1968, Ser. No. 765,301
Int. Cl. B01k 3/00
U.S. Cl. 204—59 10 Claims



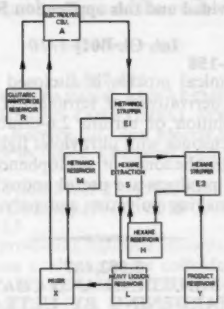
Temperature control, in a process for the electrochemical fluorination of fluorinatable feedstocks using a current-conducting essentially anhydrous liquid hydrogen fluoride electrolyte, is effected by maintaining said electrolyte at essentially its boiling point.

3,582,483
PROCESS FOR ELECTROLYTICALLY PRODUCING ALUMINUM
Mathias Ovrom Sem, Smestnd, Oslo, Norway, assignor to Elektrokemisk A/S, Oslo, Norway
Original application June 29, 1962, Ser. No. 210,289, now Patent No. 3,368,960, dated Feb. 13, 1968. Divided and this application Sept. 18, 1967, Ser. No. 669,360
Int. Cl. C22d 3/02, 3/12
U.S. Cl. 204—67 4 Claims



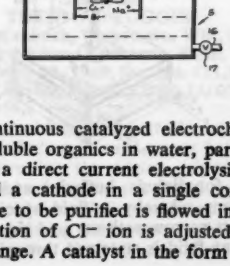
An electric furnace for production of aluminum by melt electrolysis is provided with an overhead annular Soderberg anode having a hollow center coextensive with the longitudinal anode axis. The furnace is operated under a load above 100,000 amperes and up to about 500,000 amperes, said high load being made possible by the annular configuration of the anode.

3,582,484
CONTINUOUS PRODUCTION OF DIESTERS
Ronald William Dennison and Frank Stanley Holland, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
Filed Feb. 14, 1969, Ser. No. 799,459
Claims priority, application Great Britain, Feb. 28, 1968, 9,633/68
Int. Cl. C07b 29/06; C07c 69/34
U.S. Cl. 204—79 11 Claims



Continuous production of aliphatic dicarboxylic esters by electrosynthesis from monoesters of shorter chain aliphatic dicarboxylic acids. Product is continuously removed from the electrolysis zone, e.g. by extraction with hydrocarbon solvent, and anhydride of the shorter chain aliphatic dicarboxylic acid is continuously added to react with alcoholic solvent and thereby maintains a steady concentration of monoester.

3,582,485
WATER PURIFICATION
Gerald A. Guter, San Clemente, and Leslie M. Tint, La Mirada, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Apr. 16, 1968, Ser. No. 721,623
Int. Cl. B01k 3/00; C02b 1/00, 1/82
U.S. Cl. 204—149 11 Claims



Process for continuous catalyzed electrochemical decomposition of soluble organics in water, particularly of urea in urine, in a direct current electrolysis cell having an anode and a cathode in a single compartment. The water or urine to be purified is flowed into the cell, and the concentration of Cl^- ion is adjusted as desired within a certain range. A catalyst in the form of Br^- ion

is added and voltage is applied across the electrodes causing oxidation of the Br^- ion to Br_2 and the Cl^- ion to Cl_2 which in turn oxidize the organic material in the water, for example urea in urine, to N_2 and CO_2 gases, and are at the same time reduced back to the Br^- and Cl^- ions respectively. This cycle operates continuously until all of the organic material is oxidized. The process is useful for purification of urine, secondary effluent waste water, purification of swimming pool water and drinking water, etc.

3,582,486

PHOTOCHEMICAL REACTION OF FUCHSONES AND PHENOLS TO PRODUCE BISPHENOLS

Hans-Dieter Becker, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Original application Sept. 13, 1966, Ser. No. 578,987. Divided and this application Feb. 3, 1970, Ser. No. 8,425

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 **8 Claims**

A photochemical process is disclosed for making certain hydroxyl derivatives of tetraphenyl methane by irradiating a solution of certain 2,6-disubstituted phenols and certain fuchsones with ultraviolet light in the presence of certain benzophenones or acetophenones as a photosensitizer. The products are useful antioxidants and intermediates for making polyester and polycarbonate resins.

3,582,487

POLYESTER MOULDING AND COATING COMPOSITIONS HARDENING BY ULTRA-VIOLET RADIATION IN THE PRESENCE OF A BENZOIN ARYL ETHER PHOTOSENSITIZER

Karl Fuhr, Krefeld, Hans Rudolph, Krefeld-Bockum, and Wolfgang Metzner, Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 26, 1969, Ser. No. 827,898

Claims priority, application Germany, June 11, 1968, P 17 69 576.0

Int. Cl. C08f *1/00, 21/00*

U.S. Cl. 204—159.15 **4 Claims**

The present invention relates to moulding and coating compositions hardening by ultra-violet irradiation and obtained from mixtures of unsaturated polyesters and copolymerisable monomeric compounds with a content of benzoin aryl ethers as photosensitizers.

3,582,488

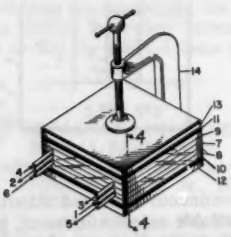
METHOD AND APPARATUS FOR BUFFERING, DIALYSIS AND CONCENTRATING BIOLOGICAL FLUID SPECIMENS

Rashid A. Zeineh, 420 Raymond Ave., Morgantown, W. Va. 26505

Filed June 25, 1965, Ser. No. 466,981

Int. Cl. B01k *1/00;* **B01d** *13/02, 13/00*

U.S. Cl. 204—180 **24 Claims**



A process for dialysis, buffering and/or concentrating fluid specimens whereby a fluid specimen is streamed through a first narrow pathway and simultaneously therewith a treating fluid is streamed through an adjacent second pathway. The first and second pathways are separated from each other by a semipermeable membrane to effect an interchange of permeable and diffusible particles though the membrane between the fluid specimen and the treating fluid so that a desired fluid is received at the output of the first pathway.

3,582,489

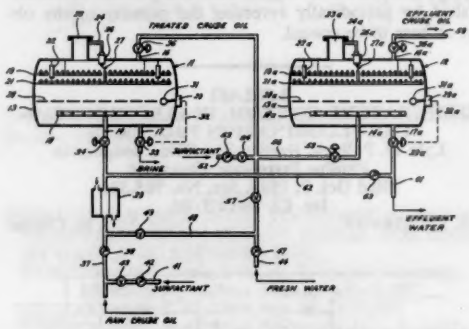
PROCESS FOR CRUDE OIL PURIFICATION

James H. Meadow, Houston, Tex., and Roy W. Greenlee, Maplewood, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 10, 1968, Ser. No. 782,534

Int. Cl. B03c *5/00*

U.S. Cl. 204—190 **10 Claims**



A process for removing metal-containing compounds from crude oil which compounds adversely affect subsequent processes in a refinery. Water is dispersed into the crude oil in the presence of an oxyalkylated amine-derived surfactant. The resultant mixture is resolved electrically into a purified crude oil phase and a water phase containing the removed metal-containing compounds. Water, in amounts up to about 10 volume percent, is preferably admixed with the crude oil after the addition of the surfactant. The surfactant has hydrophilic-hydrophobic properties for removing metal-containing compounds from the crude oil during electrical resolution of dispersed water. Preferably, the surfactant is an oxyalkylated polyalkylene polyamine, and in particular, the base-catalyzed, reaction product of tetraethylene pentamine which has been oxyalkylated with propylene oxide and ethylene oxide. The present process is particularly effective in removing iron compounds from crude oil.

3,582,490

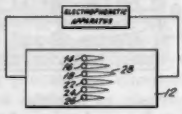
METHOD OF MAKING AND USING PROTEIN QUANTITATION PLATE FOR ELECTROPHORETIC APPARATUS

Edward S. Zemel, 708 W. 192nd St., Apt. 1A, New York, N.Y. 10040

Original application Jan. 11, 1968, Ser. No. 697,098. Divided and this application Feb. 9, 1970, Ser. No. 9,599

Int. Cl. B01k *5/00*

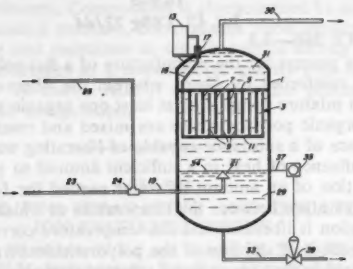
U.S. Cl. 204—180 **7 Claims**



A quantitation plate is made by coating a strip of, for example, polyester with an agar-antiserum mixture. Wells

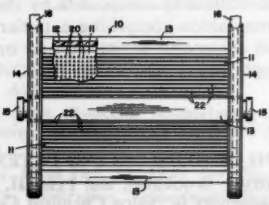
are formed in the coating and standard concentrations and a specimen of a protein to be measured are placed in the wells. The proteins are caused to migrate electrophoretically and the magnitude of migration is charted to quantitate the specimen.

3,582,491
REMOVAL OF INORGANIC CATALYSTS FROM POLYOLS
Joseph F. Louvar, Lincoln Park, and Newlin S. Nichols, Dearborn, Mich., assignors to Wyandotte Chemicals Corporation, Wyandotte, Mich.
Filed June 12, 1969, Ser. No. 832,700
Int. Cl. B03c *5/00*
U.S. Cl. 204—186 **5 Claims**



A method for removing water-soluble impurities from water-insoluble polyethers which comprises providing a mixture of water, polyether, and a solvent which is substantially immiscible in water, which has a density substantially different from water in which the polyether is soluble and which is relatively inert with respect to the polyether and water, whereby a polyether-solvent solution is formed which is substantially immiscible in water. The solvent is employed in an amount sufficient to adjust the density differential between the polyether-solvent solution and water to at least about 0.03 gram per milliliter. The polyether-solvent solution is then separated from the water by electrostatic coalescence. A stream of water containing dissolved therein the water-soluble impurities and a stream of polyether-solvent solution are separately recovered after the precipitation, followed by separating the solvent from the polyether-solvent solution.

3,582,492
PLATING BARREL
Thomas R. Gill, Pompano Beach, Fla., assignor to GS Equipment Company
Filed Feb. 12, 1968, Ser. No. 704,902
Int. Cl. C23b *5/78*
U.S. Cl. 204—213 **10 Claims**



A barrel especially adapted for use in plating, phosphating, chemical brightening, washing and similar operations wherein a quantity of workpieces are processed in a liquid bath, the barrel having a side wall formed with rows of holes extending partially therethrough from one surface and with a plurality of slots extending patrially therethrough from the other surface into communication with the holes.

ERRATA

For Classes 204—213 thru 204—302 see:
Patent Nos. 3,582,523 thru 3,582,527

3,582,493
METHOD FOR PREPARING RARE EARTH OXIDE PHOSPHORS
James W. Haynes and Jesse J. Brown, Jr., Towanda, Pa., assignors to Sylvania Electric Products, Inc.
No Drawing. Filed July 20, 1967, Ser. No. 654,702
Int. Cl. C09k *1/10*
U.S. Cl. 252—301.4R **3 Claims**

Phosphors of yttrium and/or gadolinium oxide host materials containing europium, terbium, samarium, and/or praseodymium activators are produced by coprecipitating sulfates of the host materials and activators, and then decomposing the sulfates to the oxides.

3,582,494
METHOD OF PREPARING ALKALINE SALT-FREE AQUEOUS COLLOIDAL SOLS
Peter H. Vossos, Berwyn, Ill., and Morris Mindick, Tyler, Tex., assignors to Nalco Chemical Company, Chicago, Ill.
No Drawing. Filed Mar. 27, 1968, Ser. No. 716,307
Int. Cl. B01j *13/00*; C01b *33/00*
U.S. Cl. 252—313 **8 Claims**

A method of producing aqueous colloidal alkaline silica sols from salt-free acidic aqueous colloidal sols by treating such acidic sols with at least 0.003% by weight, based on the weight of the silica in such sol, of a salt whose anion is derived from a weak acid whose ionization constant should not exceed that of carbonic acid. After the addition of salt, the pH of the treated sol is adjusted to within the range 7.0–11.0.

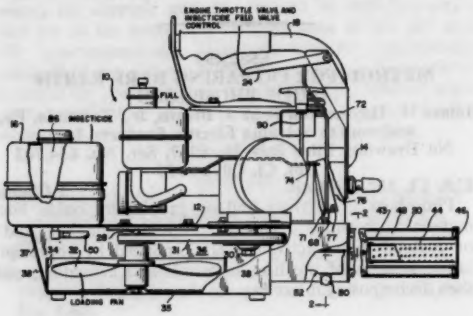
3,582,495
TREATMENT OF HYDROPHILIC POLYMERIC CAPSULE WALL MATERIAL WITH VANADIUM COMPOUNDS
Donald Day Emrick, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
No Drawing. Continuation-in-part of application Ser. No. 586,943, Oct. 17, 1966. This application Jan. 29, 1968, Ser. No. 701,129
The portion of the term of the patent subsequent to Apr. 27, 1986, has been disclaimed
Int. Cl. A01n *17/00*; B01j *13/02*; B44d *1/44*
U.S. Cl. 252—316 **6 Claims**

A process is provided for manufacturing novel, minute, capsules, en masse, wherein existing capsules having walls of water-swellable, hydrophilic, polymeric material are further treated by uranium- or vanadium-containing ions in an aqueous liquid supporting vehicle. Capsules produced by practice of this process have walls which exhibit decreased swelling in water and decreased sensitivity to high relative humidity.

3,582,496
THERMAL FOGGER
Arthur K. Pfaffenbach, Watertown, Wis., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Mar. 28, 1969, Ser. No. 811,376
Int. Cl. B01d; B01f; B01j *13/00*
U.S. Cl. 252—359A **7 Claims**

A portable thermal fogger powered by an internal combustion engine, including passage means having a venturi restriction for directing the engine exhaust gases to a forwardly disposed mixing tube for discharge therefrom, and a fogging liquid formulation tank and means including a pressure regulating carburetor having a float controlled inlet valve for directing the liquid formulation

to the passage means for admixture with said exhaust gases, and said carburetor and venturi restriction being



located laterally adjacent one another and approximately at the same vertical elevation.

3,582,497

COMPOSITIONS DERIVED FROM CONTACTING ALUMINOSILICATES AND ALUMS AND PROCESS FOR PREPARING SAME

Donald Francis Best, Tonawanda, and Anthony Peter Bolton, Amherst, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,098

Int. Cl. B01j *11/40*

U.S. Cl. 252—455R **26 Claims**

Reacting cation-exchangeable aluminosilicates with alums forms novel compositions having cation-exchange capacity permitting optional ion-exchange for control of catalytic activity and for metal-loading. In general the compositions are rendered substantially amorphous by calcination and once calcined, are useful as catalysts in various hydrocarbon modification reactions.

3,582,498

METHOD OF PRODUCING SOLVENT SOLUBLE FUSIBLE POLYPHENYLENE POLYMERS

Norman Bilow and John B. Rust, Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

No Drawing. Filed Sept. 5, 1967, Ser. No. 665,266

Int. Cl. C08g *33/00*

U.S. Cl. 260—2 **5 Claims**

The method of producing soluble and fusible polyphenylene polymers, curable to insoluble and infusible heat resistant aromatic resins, by polymerization of fused ring and non-fused ring aromatic compounds selected from the group consisting of anthracene, naphthalene, phenanthrene, biphenyl, terphenyl, quaterphenyl, isomers thereof, and mixtures of same, and mixtures of the same with other aromatic compounds with not more than and preferably less than five aromatic rings in a nitroalkane solvent for the monomers, catalyst and polymers.

3,582,499

FOAM RUBBER MADE BY REACTING A REACTIVE GROUP POLYMER LATEX WITH POLYISOCYANATES

Thomas H. Rogers, Jr., and Richard E. Fruzzetti, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 653,035, July 13, 1967. This application May 20, 1970, Ser. No. 39,170

Int. Cl. C08d *13/08*

U.S. Cl. 260—2.5 **8 Claims**

Organic cellular materials are made from foamed reactive polymeric latices treated with an organic polyisocyanate as a means of converting the latex into a useful cross-linked stable reticular structured foam.

3,582,500

PROCESS FOR THE MANUFACTURE OF A PRODUCT OF POLYURETHANE FOAM REINFORCED BY FIBRES

Jean Paul Carriere, Anieres, Geneva, and Alexis Archipoff, Carrouge, Geneva, Switzerland, assignors to Centre International pour l'Economie et la Technologie I.C.E.T., Rixensart, Belgium

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,227

Claims priority, application Belgium, Oct. 25, 1967, 14,925

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 **5 Claims**

In a process for the manufacture of a flat polyurethane foam reinforced by fibers, wherein the fibers and a reaction mixture comprising at least one organic polyol and one organic polyisocyanate are mixed and reacted in the presence of a substance capable of liberating water under the influence of heat in a sufficient amount to permit the liberation of an amount of water needed for foaming at a temperature between the temperature at which water of hydration is liberated and the temperature corresponding to the limit of stability of the polyurethane formed characterized in that borax is the substance capable of liberating water, the improvement wherein the mixing and reaction occurs in the presence of a water fixing amount of an inert hygroscopic inorganic substance capable of fixing any water liberated by the borax while dissolved in the reaction mixture until the temperature of said mixture is raised above the temperature at which water of hydration is liberated from the borax.

3,582,501

POLYURETHANE FOAMS AND PROCESS OF MAKING THEM

Fritz Hostettler and Eugene F. Cox, Charleston, W. Va., assignors to Union Carbide Corporation

No Drawing. Continuation-in-part of application Ser. No. 686,009, Sept. 25, 1957. This application Nov. 21, 1958, Ser. No. 775,390

The portion of the term of the patent subsequent to July 9, 1985, has been disclaimed

Int. Cl. C08g *22/04*

U.S. Cl. 260—2.5 **24 Claims**

This invention relates to the acceleration of reactions between compounds having a reactive group of the formula —N=C=Y, in which Y is oxygen or sulfur, with active hydrogen-containing compounds by the addition of a catalyst composition comprising a tertiary amine and an organo tin compound having at least one direct carbon to tin bond.

3,582,502

METHOD OF REINFORCING LATEX FOAM

James E. Farrow, Brookfield, and Peter H. Vossos, Berwyn, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed Dec. 6, 1968, Ser. No. 781,981

Int. Cl. C08d *13/08*; **C08f** *47/08*

U.S. Cl. 260—2.5L **4 Claims**

The compression resistance of open cell foam rubber is improved by treating the finished foam rubber with an aqueous metal-free solution of active silica, whose particle size does not exceed 5 mμ.

3,582,503

POLYOLEFIN, WAX AND OIL BLENDS

Frederick H. Horne, Lake Bluff, Ill., assignor to Mol-En Corp., Chicago, Ill.

No Drawing. Filed May 19, 1969, Ser. No. 826,000

Int. Cl. C08f *29/06*

U.S. Cl. 260—2.5 5 Claims

A novel composition of matter consisting essentially of from about five percent to about forty-five percent of a polyolefin, particularly polyisobutylene, which has a molecular weight greater than 120,000, from about fifteen percent to about seventy percent of a microcrystalline wax having a drop point between 140° F. and 215° F. and from about five percent to about eighty percent oil with or without minor diluents, oxidizers, stabilizers, or other constituents. Composition is characterized by inertia to instantaneous pressure, conformance upon application of pressure and resistance to sag, as well as having cold flow characteristics to a resistance of gravity plus about 2 gms./in.^{2} or above. Also is directed to the process of making such composition.

3,582,504

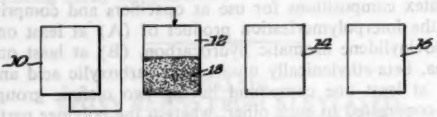
METHOD FOR SEPARATING AND ISOLATING ION EXCHANGE RESINS

Eli Salem, Brooklyn, N.Y., and Joseph H. Duff, Basking Ridge, N.J., assignors to Ecodyne Corporation, Chicago, Ill.

Filed Apr. 20, 1970, Ser. No. 30,137

Int. Cl. B01d *15/06;* C02b *1/70*

U.S. Cl. 260—2.1 7 Claims



In the regeneration of mixed-bed ion exchange resins, the resins are first separated in the conventional manner by an upflow of liquid. The resins are then isolated from one another, and contaminant cation exchange resin is separated from the anion exchange resin by floating the anion exchange resin in an intermediate-density liquid having a density intermediate between the cation and anion exchange resins. The contaminant cation exchange resin sinks to the bottom of the vessel, permitting the anion exchange resin to be readily isolated.

3,582,505

ION EXCHANGERS FROM POLY(AMINOSTYRENE) AND ETHYLENE IMINE

Geert Jan de Jong, Boekelo, Netherlands, assignor to N.V. Octrooien Maatschappij "Activit," Amsterdam, Netherlands

No Drawing. Filed Oct. 23, 1969, Ser. No. 868,939

Claims priority, application Netherlands, Oct. 24, 1968, 6815256

Int. Cl. C08l *27/08*

U.S. Cl. 260—2.1 6 Claims

Anion exchangers are prepared from polymers of vinyl aromatic hydrocarbons in which primary amino groups have been introduced into the aromatic nuclei by reacting such aminated polymers with ethylene imine. If desired, the thus obtained weakly basic polyamine resin may be quaternarized.

3,582,506

FOUNDRY COMPOSITION COMPRISING GRANULATED BASE MATERIAL, POLYISOCYANATE AND ALKYD RESIN MODIFIED WITH OIL AND POLYAMIDE RESIN

Teo Paleologo, Bettino Passalenti, Osvaldo Fiorani, and Ugo Nistri, Milan, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy

No Drawing. Filed Feb. 17, 1969, Ser. No. 799,977

Claims priority, application Italy, Feb. 17, 1968, 12,874/68

Int. Cl. B22c *1/22, 9/02*

U.S. Cl. 260—22 20 Claims

A moulding sand in which the binder comprises a mixture of a polyamide- and oil-modified alkyd resin and an isocyanate selected from diisocyanates and polyisocyanates and the catalyst comprises at least one substance selected from organic peroxides, inorganic peroxides, amines, and salts of copper, lead, cobalt, tin and zinc.

3,582,507

AQUEOUS DISPERSIONS OF POLYAMIDE RESINS

Dwight E. Peerman, Minneapolis, Minn., assignor to General Mills, Inc.

No Drawing. Continuation-in-part of abandoned application Ser. No. 460,571, June 1, 1965. This application Sept. 16, 1968, Ser. No. 762,363

Int. Cl. C08g *20/26;* C08j *3/16*

U.S. Cl. 260—23 16 Claims

There is disclosed stabilized aqueous dispersions of polyamide resins, particularly of polymeric fat acid polyamides employing a carboxy vinyl polymer as a dispersion stabilizer. Aqueous dispersions of polyamides are useful as adhesives.

3,582,508

RUBBER MODIFIED WITH ORGANIC POLYISOCYANATES IN PRESENCE OF PROMOTERS

Lester H. McIntosh, Jr., Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 625,933, Mar. 27, 1967. This application Nov. 28, 1969, Ser. No. 876,182

Int. Cl. C08c *11/00;* C08d *13/28*

U.S. Cl. 260—23.7 8 Claims

A composition and method of its preparation comprising the product of treating at least one rubber-like material selected from natural rubber and synthetic rubber with at least one polyisocyanate in the presence of at least one reaction promoter herein described wherein the composition is particularly useful in preparing a pressure sensitive adhesive. Representative of the reaction promoters are: lecithin, lead oleate, potassium oleate, dibutyltin di(2-ethylhexoate), dibutyltin dilaurate, triethylene diamine, N-methyl morpholine, N-ethyl morpholine, N,N,N',N'-tetramethylethylene diamine, and N,N,N',N'-tetramethyl-1,3-butane diamine.

3,582,509

PREPARATION OF EPOXY-ANHYDRIDE COMPOSITIONS FROM AN EPOXY RESIN AND AN ACID ANHYDRIDE CONTAINING TWO CYCLIC AND ONE LINEAR ANHYDRIDE GROUP

Henryk Staniak, Blonie k, and Piotr Penczek, Warsaw, Poland, assignors to Instytut Tworzyw Sztucznych, Warsaw, Poland

No Drawing. Filed Oct. 14, 1968, Ser. No. 767,381

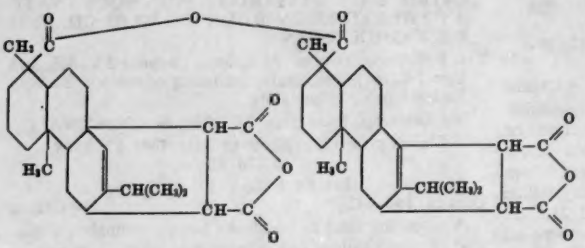
Claims priority, application Poland, Oct. 18, 1967, P 123,074

Int. Cl. C07c *63/00;* C08c *9/18*

U.S. Cl. 260—24 9 Claims

Preparation of epoxy-anhydride composition by reacting an epoxy resin with an acid anhydride containing two

cyclic and one linear anhydride group. The acid anhydride has the formula:



The reaction product is thermo hardened at 80–210° C.

In addition, there are set forth coating, impregnating, and electrocoating bath compositions comprising aqueous solutions of said copolymer; and processes for coating and impregnating a substrate which comprises applying the aqueous solution to the substrate and heating to drive off the tertiary moiety and leave a polymeric residue. The electrocoating bath composition can be applied by electrodeposition techniques.

3,582,510
FLAME-RETARDANT COMPOSITIONS FOR PLASTICS

Joseph Frederick Cannelongo, Piscataway, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 525,860, Feb. 8, 1966. This application Nov. 5, 1968, Ser. No. 773,661

Int. Cl. C08f *45/56*; C08g *51/56*

U.S. Cl. 260—28.5 **10 Claims**

Flame-retardant compositions comprising a synergistic combination of a chlorinated hydrocarbon and a phosphinic acid and thermoplastic polymers flame-retarded therewith, are disclosed.

3,582,511
PROCESS FOR FORMING IMPROVED WATER SOLUBLE, SELF CURING, THERMOSETTING RESINS

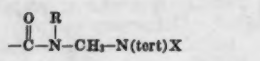
George Jalics, Rocky River, Ohio, assignor to The Glidden Company, Cleveland, Ohio

No Drawing. Filed Nov. 29, 1967, Ser. No. 686,766

Int. Cl. C08f *45/21*; C09d *5/02*

U.S. Cl. 260—29.6 **2 Claims**

This invention relates to copolymers which are soluble in water to appreciable concentration by virtue of their content of modified amide units having the general formula:



wherein R represents a member of the group consisting of hydrogen and alkyl radicals having not more than 3 carbon atoms; N (tert) represents the molecule of a tertiary base; and X represents the anion from a salt-forming acid.

In addition, the modified amide unit will decompose under the influence of heat with the copolymer self-curing to form a substantially water-insoluble thermosetting resin.

Also set forth are processes for making the copolymer by incorporating into the copolymerization reaction or reaction product, modified amide units in a partially completed state, and then completing the modification when necessary; or alternately, incorporating in the copolymer reaction products the modified amide units in the fully completed state.

3,582,512
STABLE OPACIFYING LATICES

Joel Fanti, Springfield, Mass., and David N. St. John, Berkeley Heights, N.J., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 535,689, Mar. 21, 1966. This application Apr. 2, 1969, Ser. No. 812,852

Int. Cl. C08d *7/00*; C09d *5/02*; C11d *1/00*

U.S. Cl. 260—29.7 **8 Claims**

Latex compositions for use as opacifiers and comprising the interpolymerization product of (A) at least one monovinylidene aromatic hydrocarbon, (B) at least one alpha, beta-ethylenically unsaturated carboxylic acid and (C) at least one compound having two olefinic groups non-conjugated to each other, wherein the polymer particles of the latex comprise 60 to 90 weight percent of an inner polymer composition and from 40 to 10 weight percent of an outer polymer composition oriented to the surface of the particles; said inner polymer composition being a polymer of from 65 to 100 mol percent of (A), from zero to 3 mol percent of (C) with the remainder if any being (B); said outer polymer composition being an interpolymer of from 24 to 70 mol percent of (B) and from 0.6 to 3.0 mol percent of (C) with the balance being (A).

3,582,513
HIGH VISCOSITY POLYVINYL ALCOHOL FROM HIGH-SOLIDS, LOW-VISCOSITY CONDITIONED POLYVINYL ESTER SOLUTIONS

Robert Thomas Bouchard and Paul Joseph Charles Hurtubise, Worcester, Mass., and Jack Dickstein, Huntingdon Valley, Pa., assignors to Borden, Inc., New York, N.Y.

No Drawing. Filed Feb. 9, 1968, Ser. No. 704,243

Int. Cl. C08f *27/16*

U.S. Cl. 260—33.4R **8 Claims**

This invention relates to the preparation of polyvinyl alcohols from polyvinyl esters which have been polymerized in suspension in the presence of a conditioning agent selected from the group consisting of the mono- and di-C_1–C_8 alkyd esters of itaconic and fumaric acid, said conditioning agent being present in an amount sufficient to condition the polyvinyl ester so that high solids, low viscosity solutions thereof can be used to prepare polyvinyl alcohols having a high viscosity in aqueous solution.

3,582,514

COMPOSITIONS OF PHENOL FORMALDEHYDE RESINS AND PHENOL POLYMERS OF ISOPRENE AND PROCESS FOR THE ADDITION THERETO OF ETHYLENE-PROPYLENE POLYMERS

Anthony C. Soldatos, Kendall Park, N.J., assignor to Union Carbide Corporation

No Drawing. Continuation-in-part of application Ser. No. 718,225, Apr. 2, 1968. This application Oct. 31, 1968, Ser. No. 772,422

Int. Cl. C08f *45/34*; C08g *37/18*

U.S. Cl. 260—33.4 25 Claims

This invention relates to compositions of phenolformaldehyde resins and phenolated polymers of isoprene which, when added to ethylene-propylene polymers provide compositions which develop tack in a relatively short period of time and thus are excellently suited for use in the production of automobile tires and other energy absorbing rubber products on a commercial scale.

3,582,515

HYDROCARBON OIL EXTENDED POLYMERCAPTAN RESINS

Frank R. Volgstadt, Painesville, Ohio, and Gene M. Le Fave, El Cajon, Calif., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,094

Int. Cl. C08c *11/22*; C08f *45/28*; C08g *51/28*

U.S. Cl. 260—33.6 4 Claims

Sealing, caulking and molding compositions containing liquid polymercaptan resins are compounded with petroleum oils such as rubber extender oils and/or foilage spray oils. Resulting compounded materials can be readily pourable and the oil reduces, or eliminates surface tack of resulting cured compositions.

3,582,516

EPOXY RESINS FROM ALKYLATED PHENOL NOVOLAC RESINS

John R. LeBlanc, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Mar. 20, 1969, Ser. No. 809,023

Int. Cl. C08g *5/08*, *5/18*

U.S. Cl. 260—33.6 10 Claims

Improved epoxy novolac resins produced by first reacting epichlorohydrin with an alkylated phenol aldehyde novolac resin wherein said alkylate is a specific mixture of cyclopentadiene codimer compounds, and thereafter dehydrohalogenating the resulting product.

3,582,517

HIGH TEMPERATURE PLASTIC-CERAMIC CASTABLE

John G. Bailey, Jr., Marietta, and Clarence M. Head, Jr., Atlanta, Ga., and Clarence W. Phillips, Ormond Beach, Fla., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Continuation-in-part of application Ser. No. 423,438, Jan. 5, 1965. This application May 13, 1968, Ser. No. 730,678

Int. Cl. C08g *51/04*

U.S. Cl. 260—37EP 6 Claims

A high temperature, high tensile strength plastic-ceramic castable suitable for use in easily casting into molded shapes prior to curing; the cured castable having qualities of being wear resistant, chafe resistant, corrosion resistant, heat resistant, and substantially nonshrinkable. The castable consists of a monolithic composition produced by admixing a refractory oxide filler, an epoxy resin and an aliphatic, aromatic or mixture thereof polyfunctional amine curing agent.

3,582,518

FLAME-RETARDANT COMPOSITION COMPRISING POLYVINYLIDENE FLUORIDE, ANTIMONY OXIDE AND DEHYDROFLUORINATION CATALYST

Bernard John Lyons, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 438,122, Mar. 8, 1965. This application Mar. 7, 1968, Ser. No. 711,184

Int. Cl. C08g *51/04*; C08k *1/06*

U.S. Cl. 260—41 25 Claims

Polymers are flame-retarded by incorporating into the polymer a polyvinylidene fluoride, antimony oxide and a metal activator such as metal compounds wherein the metal is selected from the group consisting of aluminum, titanium, zirconium, hafnium, columbium, tantalum, tungsten, boron, chromium, molybdenum and nickel.

3,582,519

COATING COMPOSITIONS AND LITHOGRAPHIC PLATES MADE THEREFROM

Arne E. Gomsi, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

No Drawing. Filed May 12, 1966, Ser. No. 549,491

Int. Cl. C08d *9/08*, *13/16*

U.S. Cl. 260—41.5 5 Claims

The present invention relates to hydrophilic coating compositions for lithographic plates comprising, zinc oxide, inert filler, ammonia neutralized polyacrylic acid and styrene-butadiene copolymer. Such coatings obviate the necessity for pre-treatment of the lithographic plates by brushing and/or by application of a brush coat of a polyvalent metal salt. In addition, they are completely waterproof, porous and lithographic and give good adhesion of images applied with carbon typewriter ribbons.

3,582,520

STABILIZATION OF UNSATURATED INTERPOLYMERS

Marco Wismer, Gibsonia, and Karl F. Schimmel, Verona, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,909

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.9 10 Claims

This invention relates to the stabilization of interpolymers of ethylenic hydrocarbons and a polyene, which interpolymers cure through an oxidative mechanism. It has been found that aldimines and ketimines stabilize the interpolymer against apparent autoxidation, as evidenced by film yellowing, without interfering substantially with the oxidative cure of the films.

3,582,521

HALOGEN ADDUCT OF ETHYLENE SULFIDE

Jose L. Villa, Heightstown, N.J., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed May 27, 1970, Ser. No. 40,949

Int. Cl. C08f *35/00*, *45/56*, *45/58*

U.S. Cl. 260—45.75K 11 Claims

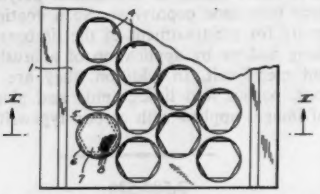
A novel halogen adduct of ethylene sulfide,

wherein X is Br. Cl or I, is prepared and used as an oxidation stabilizer in a stabilizer system for an ethylene sulfide polymer to prevent the oxidation degradation of the polymer, particularly during processing. In a preferred process the oxidation stabilizer in the system is formed in situ in the polymer by polymerizing ethylene sulfide in the presence of from about 0.04 to 4% of Br_2, Cl_2 or I_2. A thermal stabilizer is added also to the polymer before high temperature processing to prevent thermal degradation.

3,582,522
STABILISERS FOR ORGANIC MATERIALS
Arthur Stanley Briggs, Norton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed May 6, 1968, Ser. No. 727,073
Claims priority, application Great Britain, May 11, 1967, 21,879/67
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.85 14 Claims

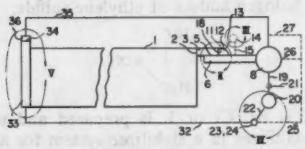
Borates of alkanes which are substituted by at least three hydroxyphenyl groups, or mixtures of such alkanes and boric oxide, boric acid or a borate ester, are valuable stabilisers for organic materials. Preferably they are used with diesters of thiodialkanoic acids, for example, dilauryl thiodipropionate.

3,582,523
ELECTROPLATING BARREL
Paul Linnhoff, Iserlohn, Germany, assignor to Wilhelm Linnhoff oHG, Hemer, Germany
Filed Dec. 12, 1968, Ser. No. 783,347
Claims priority, application Germany, Dec. 13, 1967, P 16 21 104.4
Int. Cl. C23b *5/78*
U.S. Cl. 204—213 10 Claims



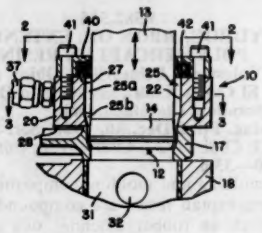
A rotary electroplating barrel wherein the shell is provided with polygonal openings for removable one-piece plastic inserts. The inserts are formed with perforations for the passage of electroplating fluid.

3,582,524
MERCURY-PROCESS ELECTROLYTIC APPARATUS
Hiroshi Shibata, Teruo Imai, Shigeji Kumaki, Junichi Ando, Toshio Enoki, and Isao Okazaki, Iwaki-shi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed June 28, 1968, Ser. No. 741,109
Claims priority, application Japan, Nov. 24, 1967, 42/75,372, 42/75,373, 42/75,374
Int. Cl. C22d *1/04*
U.S. Cl. 204—220 4 Claims



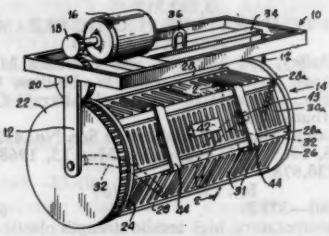
The main mercury circulation system through an electrolytic cell, a denuding device, and a mercury pump in a mercury-process electrolytic apparatus is fully sealed and isolated from the atmosphere during operation and is provided with a separation device outside of the system for removing contaminants from the mercury amalgam conducted from the electrolytic cell to the denuding device, a device for preventing backflow of mercury when the mercury pump stops, and a bypass device for circulating contaminants within denuded mercury, together with a part of this mercury and wash water, back to the denuding tower.

3,582,525
ELECTROLYTE MANIFOLD FOR ELECTRO-CHEMICAL MACHINING
Robert S. Hahn, Northboro, Mass., and Charles Evans Foertmeyer, Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Nov. 29, 1967, Ser. No. 686,430
Int. Cl. B23p *1/04;* B01k *3/00*
U.S. Cl. 204—224 3 Claims



An electrolyte manifold for use in an electrochemical machining apparatus where previously formed workpieces are machined to precise dimensions by a tool includes a body member surrounding the electrochemical machining tool having a chamber of generally circular cross section into which the electrolyte is injected so that it flows tangentially around the tool and smoothly and uniformly into the space between the tool and the workpiece.

3,582,526
ELECTROPLATING BARREL
Charles R. Campana, Bronx, N.Y., assignor to Spectranome Plating Company, Inc., New York, N.Y.
Filed Dec. 15, 1967, Ser. No. 690,881
Int. Cl. C23b *5/78;* B01f *13/00*
U.S. Cl. 204—213 6 Claims



An electroplating barrel adapted for mounting rotatably within a tank of a plating solution, said barrel comprising side panels and end walls defining a chamber within which bulk quantities of small workpieces may be electroplated, the panels being formed with slots

therethrough of greater width at the outer surface of the wall of the barrel than at the inner surface of said wall, whereby upon rotation of the barrel a concentrated plating solution in the tank is adapted to freely enter within the barrel to maintain therein a desired density of the plating solution to compensate for and replace the metal deposited on the workpieces from said solution.

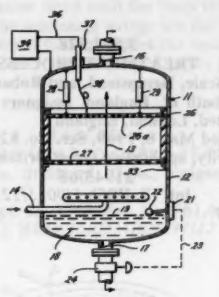
3,582,527

UNIFORM ELECTRIC FIELD TREATING SYSTEM

Roy N. Lucas, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed May 15, 1969, Ser. No. 825,015
Int. Cl. B03c 5/02
U.S. Cl. 204—302 **9 Claims**

A system, including apparatus for electrically resolving a dispersion consisting of immiscible and liquid phases. The dispersion flows along a vertical flow axis between inlet and outlet zones. An electric field for resolving the dispersion is established in a region between a horizontally disposed, foraminous electrode and the inlet zone through which region passes substantially all of the fluid. The electric field increases monitonically in potential toward the electrode and has planes of constant potential transverse to the direction of dispersion flow. The phases resolved from the dispersion in the electric field are recovered from the outlet zones.

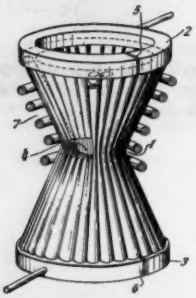


ELECTRICAL

3,582,528
TREATMENT PROCESS

Allen Gordon Seale, Hempstead, and Robert Charles Vasper, Harpenden, both of, England, assignors to Stanelco-Thermatron Limited, London, England

Filed May 8, 1969, Ser. No. 822,876
Claims priority, application Great Britain, May 9, 1968, 21945/68
Int. Cl. H05b *5/00, 5/12*
U.S. Cl. 13—27 **5 Claims**

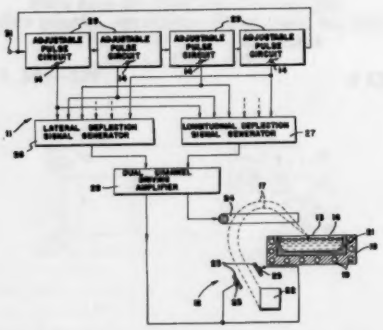


This invention relates to that method of processing charges of electrically conducting or semiconducting material by fusing the charge in a crucible by means of induction heating effects induced in the charge by a working coil surrounding the crucible. The invention is characterized in that the crucible is provided with a pouring aperture in the base thereof and that the charge is supported above the pouring aperture in the crucible at least during the fusing thereof by means of electromagnetic forces induced in the charge by the working coil. Preferably the crucible is a liquid-cooled crucible of an electrically conducting material (i.e. is fabricated from a cage of water-cooled copper tubes).

3,582,529
ELECTRON BEAM HEATING APPARATUS AND CONTROL SYSTEM THEREIN

Emmett R. Anderson; Kurt D. Kennedy, Berkeley, and Sherman Tsou, Palo Alto, all of, Calif., assignors to Air Reduction Company, Incorporated, New York, N.Y.

Filed Sept. 24, 1969, Ser. No. 860,680
Int. Cl. H05b *7/00*
U.S. Cl. 13—31 **8 Claims**

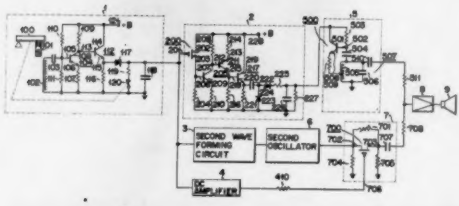


Electron beam heating apparatus is described in which the electron beam is deflected to a series of impact positions on a target surface. Signals for operating deflecting fields are produced by signal-generating means having provision for adjusting the duration at which the signal is at any given level. The energy applied to the target surface by the beam at any of the plurality of impact positions is thereby controllable by controlling the length of the time during which the beam is directed at each position.

3,582,530
ELECTRONIC MUSICAL INSTRUMENT PRODUCING PERCUSSION SIGNALS BY ADDITIVE MIXING OF COMPONENT SIGNALS

Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizouka-Ken, Japan

Filed Mar. 11, 1970, Ser. No. 018,655
Int. Cl. G10h *5/08, 1/02*
U.S. Cl. 84—1.26 **7 Claims**



An electronic musical instrument for simulating percussion sounds comprises a touch-responsive keyboard section for generating a voltage whose level varies in accordance with the magnitude of force with which the key is depressed to give forth percussion sounds, a low frequency oscillator having a relatively long period of oscillation activated by signal from said section and a similarly activated high frequency oscillator having a relatively short period of oscillation, wherein the levels of signals from both of the oscillators are respectively controlled according to the magnitude of voltage derived from said touch-responsive keyboard section in such a manner that the voltage level of the high frequency oscillator is controlled to a greater extent than that of the low frequency oscillator, and there are mixed a controlled signal component from said high frequency oscillator and a signal component from said low frequency oscillator so as to generate percussion sounds more truthfully simulating those of a natural percussion instrument.

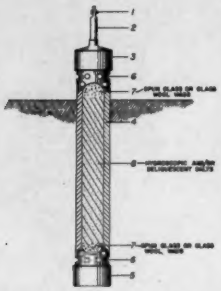
3,582,531
ELECTROCHEMICAL GROUNDING ROD

Albert P. Sheelor, 110 South Barranco, Covina, Calif.

Continuation-in-part of application Ser. No. 756,194, Aug. 29, 1968, now abandoned. This application Dec. 18, 1969, Ser. No. 886,417
Int. Cl. H01r *3/06*
U.S. Cl. 174—6 **7 Claims**

An electrical grounding device comprising a metal pipe capped and perforated at both ends and filled with deliquescent salts which dissolve to form an electrolyte. The pipe is buried vertically in the ground with only the perforated upper end protruding above the surface, to which electrical circuits are connected. Atmospheric air enters and leaves the pipe through the exposed perforations, and moisture is continually taken out of the air by the deliquescent material, dissolving some of the salts. The

resultant solution leaks out through the perforations in the bottom of the pipe, penetrating and moistening the soil with



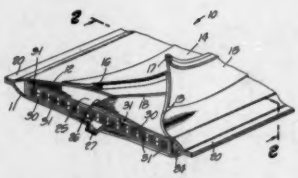
electrolyte to provide a low resistance electrical path to ground.

3,582,532

SHIELDED JACKET ASSEMBLY FOR FLAT CABLES

Walter A. Plummer, 3546 Crowanridge Drive, Sherman Oaks, Calif.

Filed Nov. 26, 1969, Ser. No. 880,058
Int. Cl. H01b 11/06
U.S. Cl. 174—36 12 Claims



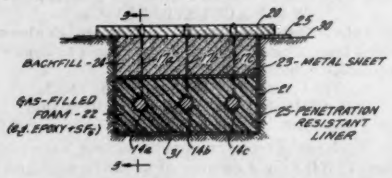
A normally fully flattened tubular jacket assembly of flexible nonconductive material having a reclosable interlocking seam and enclosing a longitudinally split inner tubular layer of flexible conductive electric shielding material adapted to embrace a flat cable of conductors. The shielding tube is permanently attached to the interior side of the nonconductive material and to a grounding conductor.

3,582,533

UNDERGROUND TRANSMISSION SYSTEM EMPLOYING BARE CONDUCTORS SUPPORTED BY ELECTRICAL INSULATING FOAM

Roy H. Albright, Greensburg, and Robert M. Clark, Ligonier, both of, Pa., assignors to ITE Imperial Corporation, Philadelphia, Pa.

Filed Sept. 16, 1969, Ser. No. 858,394
Int. Cl. H02g 9/00, 1/00
U.S. Cl. 174—37 10 Claims



High-voltage electric power is transmitted over long distances through bare conductors located underground and surrounded by a foam having insulating gas such as sulphur-hexafluoride (SF_6) entrapped in the cells thereof. During installation the conductors are supported by means of insulating strings hanging from crossmembers laid across the top surface of an installation ditch until the foam structure solidifies, at which time the insulating strings are cut and the earth backfilled. The solidified foam provides the means of support for the conductors, with the entrapped gases providing the necessary insulation.

3,582,534

STRESS CASCADE-GRADED CABLE TERMINATION

Harry C. Anderson, Stratford, Colo., assignor to General Electric Company

Filed Sept. 23, 1968, Ser. No. 761,614
Int. Cl. H02g 15/02; G01r 31/12
U.S. Cl. 174—73R 8 Claims

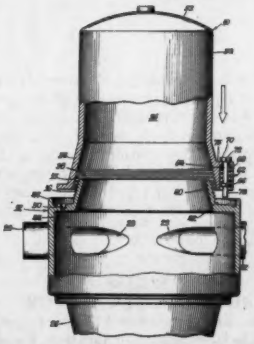
Electric-cable-terminating means for substantially inhibiting ionization at the termini in which semiconductive coatings are applied in a cascade arrangement, relative to resistance per square, onto the insulation layer for a predetermined length from the high-voltage output end to establish electrical contact with the ground-shielding means. Each coating has a predetermined resistance per square different in value from an adjacent coating, or coatings, and cascaded progressively upward in value from the ground-shielding means so that the coating adjacent the shielding means has the lowermost value. The cascaded coatings have a predetermined resistance per square sufficient so that the electrical stress at the surface for said length does not exceed the ionization start level of the cable.

3,582,535

CONICALLY MATING EXPLOSIONPROOF HOUSING AND COVER ASSEMBLY

Arthur I. Appleton, Bridlewood Road, Northbrook, Ill.

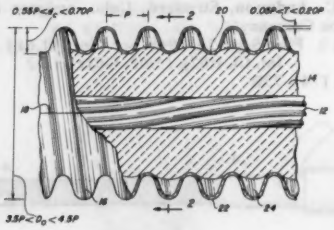
Filed Mar. 9, 1970, Ser. No. 017,499
Int. Cl. H05k 5/00
U.S. Cl. 174—52 8 Claims



The threads by which a cover is secured to a housing for electrical elements are positioned on mating conical surfaces. The taper of the threaded conical surfaces is sufficient to permit bringing the threads on the cover down over most of the threads on the housing by simply axially mating the cover with the housing. A few turns of the thus positioned cover brings all the threads into engagement to provide an "explosionproof" closure, e.g., with six full threads engaged. Stop-

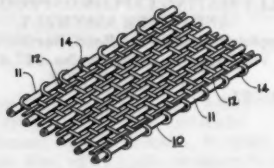
lock means prevent advance of the cover to zero clearance between threads and prevent inadvertent partial unthreading.

3,582,536
CORRUGATED COAXIAL CABLE
Robert F. Miller, Chicago, Ill., assignor to Andrew Corporation, Orland Park, Ill.
Filed Apr. 28, 1969, Ser. No. 819,691
Int. Cl. H01b *11/18*
U.S. Cl. 174—102 **2 Claims**



The bending life of coaxial cable with a helically corrugated copper outer conductor is greatly increased, without impairment of other important mechanical or electrical characteristics, by employing specific relations of corrugation pitch and depth to each other and to overall cable diameter.

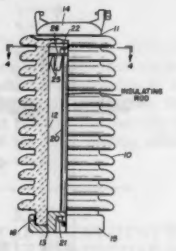
3,582,537
WOVEN CABLE WITH BONDED WOVEN LATTICE STRUCTURE
Aime J. Perreault, South Burlington, Vt., assignor to Haveg Industries, Inc., Wilmington, Del.
Filed Nov. 26, 1969, Ser. No. 880,012
Int. Cl. H01b *7/08*
U.S. Cl. 174—117 **12 Claims**



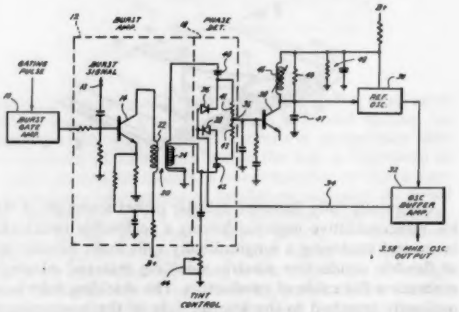
A woven ribbon cable wherein a woven lattice structure holds a plurality of conductor wires in a given spaced parallel relationship and has its warp and weft members bonded to each other at the intersections thereof, whereby the lattice structure can be pushed back from one end of the cable as a unitary structure without unraveling or fraying during insulation stripping of the cable for termination or any of the wires of the cable can be removed from the cable without disturbing the lattice structure.

3,582,538
PRESTRESSED INSULATOR
Stanley C. Killian, and Benjamin F. Dewey, both of LeRoy, N.Y., assignors to Interspace Corporation, Parsippany, N.J.
Continuation-in-part of application Ser. No. 787,948, Dec. 30, 1968, now abandoned. This application Dec. 22, 1969, Ser. No. 887,433
Int. Cl. H01b *17/14*
U.S. Cl. 174—158 **5 Claims**

This disclosure relates to porcelain insulators, particularly post insulators. Such post insulators are subjected to cantilever loads which induce tensile bending stresses in the porcelain. Unfortunately porcelain is weak in tension. Accordingly the inventors here teach prestressing the porcelain in compression so that prestress compression counters tension induced by the cantilever loads so that the insulator is enabled to carry greater loads more reliably.



3,582,539
COLOR PHASE LOCK
Jimmy W. Wheeler, Mesquite, Tex., assignor to Teletronics Industries, Inc., Dallas, Tex.
Filed Nov. 20, 1968, Ser. No. 777,226
Int. Cl. H04n *9/44*
U.S. Cl. 178—5.4 **6 Claims**

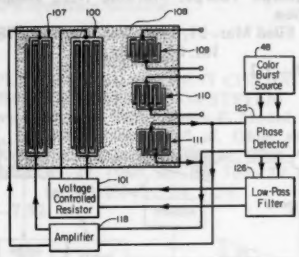


A color sync system for a color television receiver comprising a color burst amplifier, a phase detector, and a subcarrier reference oscillator, and including a diode to receive the output signal of the phase detector and automatically vary the capacitance of the input-tuned circuit of the oscillator.

3,582,540
SIGNAL TRANSLATING APPARATUS USING SURFACE WAVE ACOUSTIC DEVICE
Robert Adler, Northfield; Adrian J. DeVries, Elmhurst, and Fleming Dias, Chicago, all of, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Apr. 17, 1969, Ser. No. 817,093
Int. Cl. H04n *9/00;* **H03h** *7/30;* **H03b** *5/00*
U.S. Cl. 178—5.4R **8 Claims**

A color television receiver employs surface wave integratable filters (SWIFS) in a number of its different stages. These include frequency discriminators, phase discriminators, phase shifters, gain control systems, phase splitters, phase delay systems, signal splitters and chroma demodulation systems. The delay in or the tuning of the different individual stages is

facilitated by alterations of the velocity of wave propagation or the effective or actual length of the surface over which the



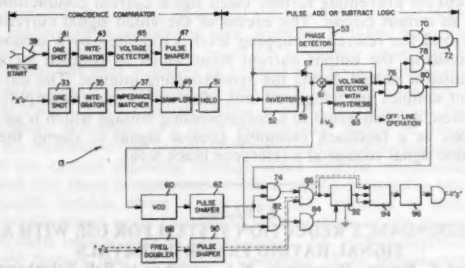
waves propagate. In addition, spurious signal modes are minimized by polarizing only selected portions of the SWIFS.

3,582,541

COINCIDENCE SERVOSYSTEM

James W. Hebb, Mountain View, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 19, 1967, Ser. No. 676,502
Int. Cl. G11b *21/02*; H02p *5/28*
U.S. Cl. 178—6.6 **18 Claims**



A method and digital servosystem for enabling synchronization of twc related systems. The digital servosystem includes a basic servo having a digital comparator receiving a first command signal and a feedback signal, a coincidence servo interrupting the feedback signal path and receiving input signals of a second command signal and a signal indicative of the condition of the basic servo, the coincidence servo providing an error digital signal responsive to the relationship of the input signals, said coincidence servo adding or subtracting pulses to the feedback signal to step position the basic servo to phase it with the second command signal, the coincidence servo being locked out when the basic servo is in phase.

3,582,542

MULTIPLEXED, SEQUENTIAL DOT INTERLACED TELEVISION SYSTEM

Edward S. Smierciak, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of application Ser. No. 658,095, Aug. 3, 1967, now abandoned. This application Apr. 15, 1970, Ser. No. 028,213
Int. Cl. H04n *7/08*
U.S. Cl. 178—6.8 **14 Claims**

A multiplexed sequential dot interlaced television system having a plurality of television cameras at the transmitting station with a common source of line and frame synchronizing signals supplying all of the cameras. A clock pulse generator is provided for generating a train of clock pulses having a frequency

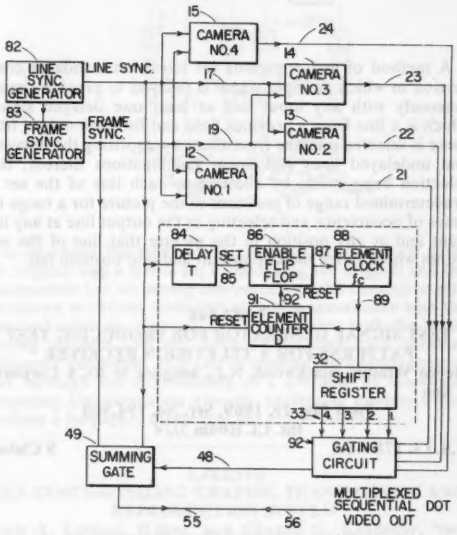
$$f_c = f_e n_2$$

where f_e is the sampling signal frequency

$$f_e = fv(LD)/(n_1 n_2)$$

where f_v is the frequency of the frame synchronizing signals, L is the number of lines in one frame, D is the number of clock pulses occurring during one line, n_1 is the vertical interlace ratio (if any), and n_2 is a predetermined dot interlace ratio, it being required that the quotient LD/n_1n_2 be irreducible and that there are no more cameras than the dot interlace ratio. A shift register is provided coupled to the clock pulse generator and having n_2 output channels, the shift register thus sequentially switching successive ones of the clock pulses to successive ones of its output channels so that a train of sampling pulses having a frequency f_e is provided in each output channel of the shift register, these trains of sampling pulses being respective phase-displaced by the period of the clock pulse frequency f_c.

A plurality of sampling gates is provided respectively coupling the output circuits of the cameras to a video signal transmission facility, each of the sampling gates having a sampling signal output circuit which is coupled to a different output channel of the shift register. Each of the sampling



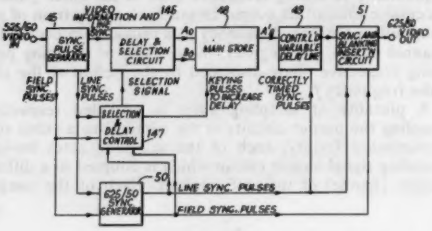
gates thus passes a train of sampled video signals from the respective camera to the transmission facility, the trains of sampled video signals being multiplexed in the transmission facility by reason of the phase-displacement of the trains of sampling signals. The line and frame synchronizing signals are also applied to the transmission facility.

At the receiving station, a plurality of video monitors is provided equal in number to the cameras and each having line and frame sweep means and a video signal input circuit. A synchronizing signal detector circuit is coupled to the transmission facility for separating the line and frame synchronizing signals which are applied to all of the video monitors. Another clock pulse generator is provided which generates a train of clock pulses having a frequency f_c, this receiving station clock pulse generator being coupled to the synchronizing signal detector and synchronized with the clock pulse generator at the transmitting station by the separated line synchronizing signals. Another shift register is provided coupled to the receiving station clock pulse generator and also having n_2 channels. Another plurality of sampling gates is provided equal in number to the video monitors and respectively coupling the monitors to the transmission facility. Each of the receiving stations sampling gates has a sampling signal input circuit which is coupled to a different one of the receiving station output channels.

3,582,543
TELEVISION STANDARDS CONVERSION

Robin D. Davies, Horley, and George D. Monteath, Tadworth, both of Surrey, England, assignors to The Marconi Company Limited and Standard Telephones & Cables Limited, both of London, England

Filed Oct. 7, 1968, Ser. No. 765,305
Claims priority, application Great Britain, Oct. 10, 1967, 46246/67
Int. Cl. H04n 5/02
U.S. Cl. 178—6.8 8 Claims

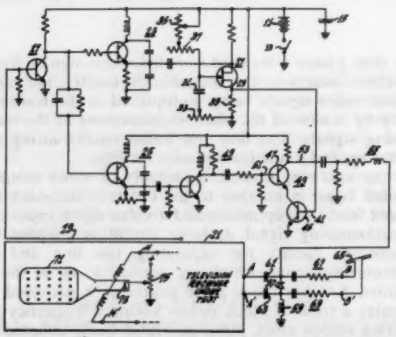


A method of and apparatus for television standards conversion in which an input signal is delayed to provide simultaneously with any input line at least one delayed signal which is a line from a previous field and for each output line there is selected one line from the set comprising the delayed and undelayed lines and linear combinations thereof, the selection being made by allotting to each line of the set a predetermined range of positions in the picture for a range of times of occurrence and selecting as the output line at any instant and at any position in the picture that line of the set within whose range the said instant and said position fall.

3,582,544
TEST SIGNAL GENERATOR FOR PRODUCING TEST PATTERNS FOR A TELEVISION RECEIVER

Steven Wlasuk, Blackwood, N.J., assignor to RCA Corporation

Filed Jan. 29, 1969, Ser. No. 794,960
Int. Cl. H04m 5/24
U.S. Cl. 178—6.8 9 Claims

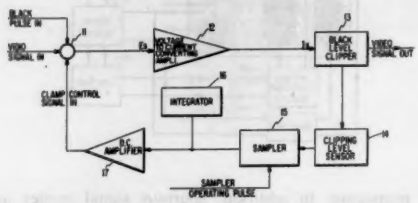


Test signal-generating apparatus for producing test patterns for a television receiver. Pulse trains are produced at integral multiples of television horizontal and vertical scanning rates and are supplied to a coincidence circuit. A diode coupled across the antenna input terminals of the receiver and arranged to be nonconductive for received broadcast signals is rendered conductive by an output from the coincidence circuit.

3,582,545
AUTOMATIC BLACK LEVEL VIDEO SIGNAL CLIPPING AND CLAMPING SYSTEM

Laurence Joseph Thorpe, Marlton, N.J., assignor to RCA Corporation

Filed Mar. 21, 1969, Ser. No. 809,178
Int. Cl. H04n 5/16
U.S. Cl. 178—7.2 11 Claims

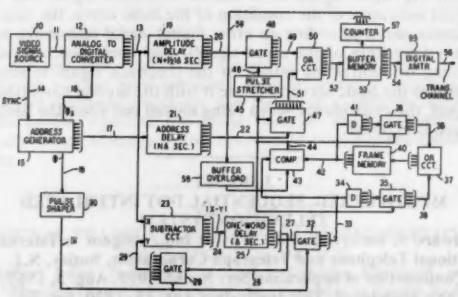


A transistor amplifier converts a video signal voltage at its input circuit into a corresponding video signal current at its output circuit which is applied to the input of a black level clipper transistor. A high impedance constant reference current source is coupled to both the input of the clipper transistor and to the output circuit of the amplifier. The clipper transistor linearly transfers the video signal at its input to its output circuit until the input video signal current equals the constant current, whereupon the clipper transistor is cut off preventing further video signal current conduction in its output circuit. The excess of the video signal current beyond the reference clipping level is detected by a sensor transistor, the output current from which is sampled by a transistor pulsed during the synchronizing interval. The current samples are integrated and, after direct current amplification, are converted to a corresponding voltage which is applied as a feedback clamping control signal to clamp the video signal voltage at a reference black level.

3,582,546
REDUNDANCY REDUCTION SYSTEM FOR USE WITH A SIGNAL HAVING FRAME INTERVALS

Earl F. Brown, Piscataway, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

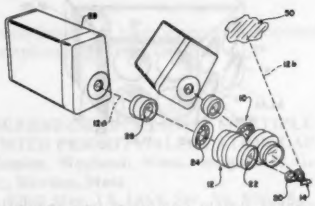
Filed June 13, 1969, Ser. No. 833,129
Int. Cl. H04n 7/12
U.S. Cl. 178—7.1 7 Claims



A redundancy reduction system is described in which plural amplitude samples of a video signal are taken during each frame interval. The amplitude values for each set of four samples are coupled to the input of a circuit which operates in accordance with a fixed function to produce an indicator word for that set. The indicator words thereby generated for an entire frame interval are stored in a frame memory at positions in the memory corresponding to their respective set positions within the frame interval. In succeeding frames a

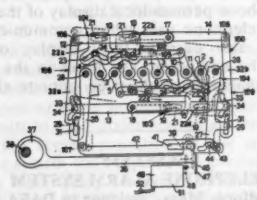
similarly generated indicator word for a set of samples is compared with its corresponding stored indicator word from the frame memory. Only if a difference exists between the two indicator words is the set of new amplitude samples transmitted to a receiving location.

3,582,547
MULTIPLE-CHANNEL VERGENT CONJUGATES IMAGERY GENERATOR SYSTEM
James A. Horton, Munroe Falls; James E. Mount, Stow, and Roderic H. O'Connor, Akron, all of, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed Oct. 21, 1968, Ser. No. 769,279
Int. Cl. H04n *5/24, 5/26*
U.S. Cl. 178—7.92 **5 Claims**



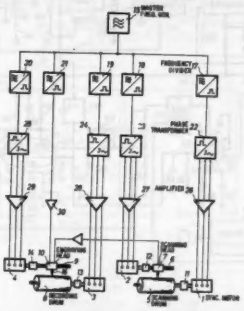
The invention provides an optical pickup whose entrance pupil is externally located and whose image is rectilinearly generated. A plurality of optical systems with each providing a moderately large field of view, together with low distortion and an external entrance pupil are physically integrated so that the entrance pupils of all systems occupy a common spatial location, representing the real world location of an observer's eyes. Each channel shares a physically common first element consisting of a fixed multifaceted mirror or prism. This element serves to fold the components of the remainder of the optical channels through some angular relationship such that these components are then closely grouped in side-by-side fashion about a reference axis oriented at some predetermined angle (nominally 90°) to those of the several incident optical axes in object space. An infinite-depth-of-field feature may be utilized, operating on an independent per channel basis. The imagery generated by the individual channels can then be recombined and presented as a display for simulator purposes to represent for example the real world visual environment as seen by the pilot of an aircraft or other vehicle.

3,582,548
PARITY CHECK DEVICE
Sergio Garberi, Ivrea, and Gian Franco Defalco, Banchette, both of, Italy, assignors to Ing. Olivetti C. & C. S. p. A., Torino, Italy
Filed Sept. 24, 1968, Ser. No. 762,015
Claims priority, application Italy, Sept. 30, 1967, 53,198 A/67
Int. Cl. B41b *25/24*
U.S. Cl. 178—23A **24 Claims**



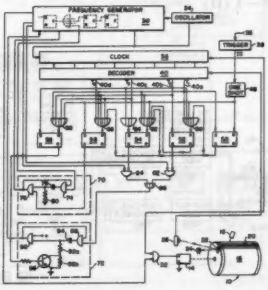
A parity check device for code combinations comprising a plurality of binary code units. The device includes a plurality of elements which are shiftable between a pair of positions in response to the positioning of a corresponding binary code member. An indicator is provided for signalling whenever the positions of the elements are not in parity with a predetermined code combination. The signal may be given, for example, in response to the presence of an odd (or even as the case may be) number of ones.

3,582,549
METHOD OF AND APPARATUS FOR DRIVING ENGRAVING MACHINES OF THE DRUM TYPE
Rodolf Hell, and Heinz Taudt, both of Kiel, Germany, assignors to Dr.-Ing. Rudolf Hell Kommanditgesellschaft, Kiel, Germany
Filed Nov. 26, 1968, Ser. No. 779,177
Claims priority, application Germany, Dec. 6, 1967, H64681
Int. Cl. H04n *1/06*
U.S. Cl. 178—69.5F **10 Claims**



In an engraving machine the rotating drums which carry the original and a media for reproducing the original and the mechanisms for advancing movements of the respective styli are driven at various rotational speeds in accordance with the required ratios for reproduction by powering both the transmitting machine and the receiving machine by a constant frequency generator, or a pair of constant frequency generators, through the intermediary of a plurality of respective frequency transformation circuits, preferably circuits which perform a frequency division of the master frequency.

3,582,550
SELF-SYNCHRONIZING GRAPHIC TRANSMISSION AND REPRODUCTION SYSTEM
Lewis A. Latanzi, Wilton, and Edward G. Keplinger, New Milford, both of, Conn., assignors to Graphic Sciences, Inc., Danbury, Conn.
Filed Dec. 4, 1968, Ser. No. 781,063
Int. Cl. H04l *7/00*
U.S. Cl. 178—69.5 **17 Claims**



The angular position of a drum in a rotary drum facsimile system is synchronized with respect to a clock by means of a

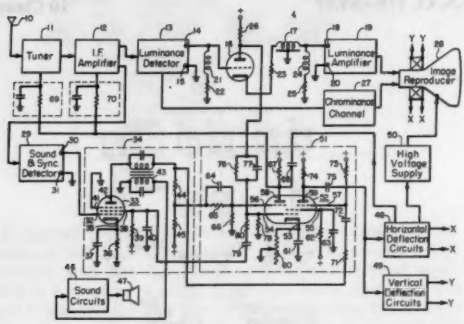
variable frequency generator which drives the drum motor at different speeds dependent on the error in the drum angle until this error is reduced to an acceptable amount. A unique multivibrator having a controllable pulse length is used to vary the driving speed.

3,582,551

TELEVISION RECEIVER NOISE IMMUNE AUTOMATIC GAIN CONTROL AND SYNC SEPARATOR CONTROL SYSTEM

Robert W. Krug, Janesville, Wis., assignor to Zenith Radio Corporation

Filed Sept. 6, 1968, Ser. No. 757,858
Int. Cl. H04n *5/56, 5/12*
U.S. Cl. 178—7.3 **6 Claims**



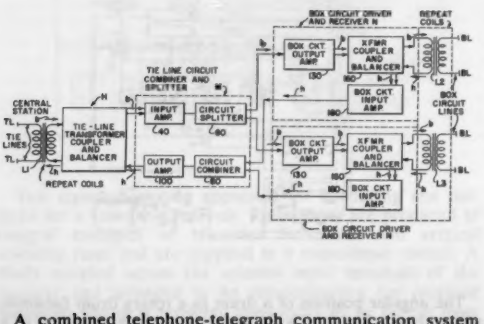
A noise-immune control system for a television receiver comprising a semidivided pentode having respective sections for AGC and synchronizing signal separator functions and a positively-biased noise-gating grid for interrupting both sections in the presence of signals in excess of a predetermined threshold level. Negative-polarity composite video signals including undesired impulse noise are applied to the gating grid via a DC coupling network to interrupt AGC and synchronizing signal separator action during the presence of noise impulses. A positive-polarity pulse is also applied via an AC only coupling network to the gating grid coincidentally with the composite video signal to prevent the AGC section from being cutoff and the receiver from becoming paralyzed should the composite video signal applied to the gating grid momentarily exceed the threshold level, as when switching from a weak channel to a strong channel because of the finite time constant of the receiver AGC system.

3,582,552

TELEPHONE-TELEGRAPH COMMUNICATION SYSTEM

Robert B. Mc Leod, Clinton, Mass., assignor to Gulf & Western Systems Company, New York, N.Y.

Division of Ser. No. 668,593, Sept. 18, 1967, Pat. No. 3,522,370.
Int. Cl. H04m *9/04*
U.S. Cl. 179—1 (H) **12 Claims**



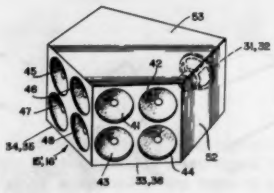
A combined telephone-telegraph communication system including a central station, a substation and a plurality of local stations connected together by coupling transformers. The substation includes bypassing equipment that permits telephone and telegraph communication signals between any of the local stations and the central station to be balanced, amplified and isolated so that usable telephone and telegraph signals are routed to the units for which they are intended.

3,582,553

LOUDSPEAKER SYSTEM

Amar G. Bose, Chestnut Hill, Mass., assignor to Bose Corporation

Filed Dec. 4, 1967, Ser. No. 690,695
Int. Cl. H04r *1/28*
U.S. Cl. 179—1 **35 Claims**



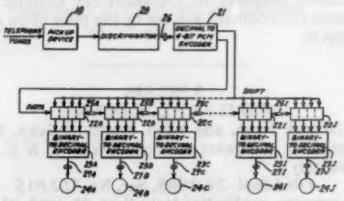
A loudspeaker system comprises two angularly displaced rear rectangular baffles each nearly filled with four closely spaced full-range small loudspeakers and partially enclosing a substantially fluid-tight volume also enclosed by a front baffle containing a small asymmetrically located loudspeaker so that the angularly inclined baffles typically face a wall to which the front baffle is generally parallel. The small loudspeakers are connected in phase and energized through means including a complementing circuit so that the overall system is characterized by a phase-frequency response characteristic that pleasingly reproduces music.

3,582,554

PORTABLE TELEPHONE COMPUTER TERMINAL

Alfred S. Le Blang, Elnora, N.Y., assignor to General Electric Company

Filed Jan. 21, 1969, Ser. No. 792,570
Int. Cl. H04m *11/06*
U.S. Cl. 179—2DP **3 Claims**



Portable display apparatus including a pickup device coupled electromagnetically or acoustically to a selective tone generating telephone permits local display of the digits transmitted by the telephone user when communicating with a computer, and also permits local display of the digits received from the computer. The tones in the receiver are converted to signals which selectively actuate electronic display elements.

3,582,555

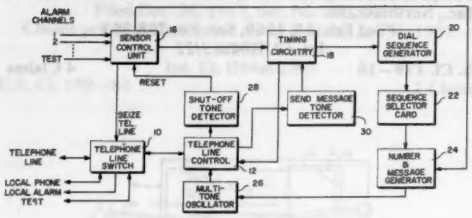
TELEPHONE ALARM SYSTEM

Jurgen Kok, Bedford, Mass., assignor to DASA Corporation, Andover, Mass.

Filed Mar. 27, 1968, Ser. No. 716,624
Int. Cl. H04m *11/04, 1/44*
U.S. Cl. 179—5 **6 Claims**

An alarm system for automatically dialing a predetermined number in response to an emergency event and, upon con-

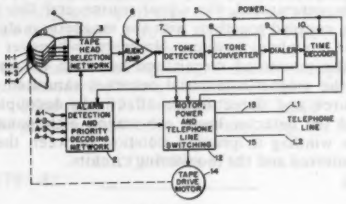
nection with the called station, transmitting an emergency message to the called station. Number and message generation is accomplished by logic circuitry associated with appropriate telephone signal generators.



3,582,556
LOW-CURRENT-DRAIN REMOTE MULTIPLE-ALARM SYSTEM WITH PRIORITY-ALLOCATION CAPABILITY

Saul B. Dinman, Wayland, Mass., assignor to G. R. Industries, Inc., Newton, Mass.

Filed Mar. 13, 1969, Ser. No. 806,884
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 **13 Claims**



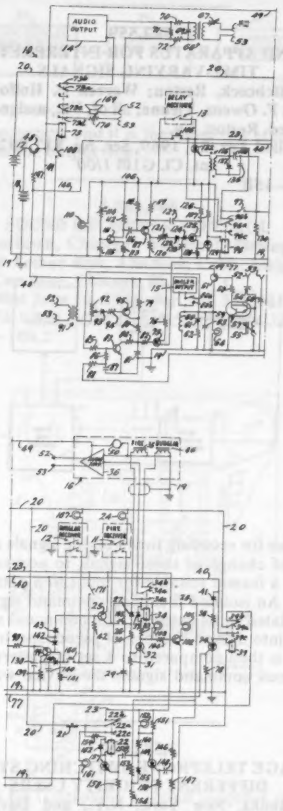
The disclosure describes a system composed of four channels of alarm-sensing electronic circuits, a four-track tape loop having four separate verbal messages recorded on it, in combination with a communications line hookup, for receiving an alarm signal in any channel and transmitting over lines a recorded message characteristic of the received alarm. The electronic circuits allot among themselves priority of simultaneously received alarm signals according to a selected scheme, and on a first-come, first-served basis if not received simultaneously.

3,582,557
BURGLAR AND FIRE ALARM

Nelson A. Friberg, and Ronald A. Friberg, both of Toledo, Ohio, assignors to International Assemblix Corportation, Toledo, Ohio

Filed June 17, 1969, Ser. No. 834,007
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 **14 Claims**

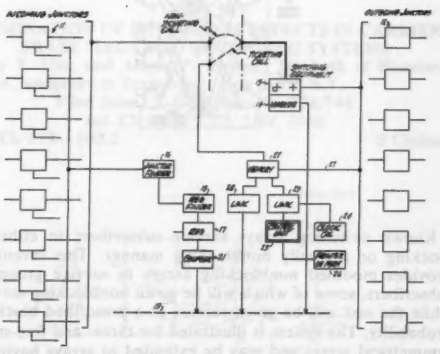
An automatic alarm system responsive to the occurrence of a fire or a burglary in a monitored area. When a fire or a burglary is sensed, the system seizes a telephone line, successively dials one or more predetermined stations and successively transmits to each dialed station a prerecorded message relating to the sensed condition. If the sensed persists or reoccurs, the system will recycle for a predetermined number of times. A time delay circuit is automatically energized when the burglar channel of the alarm is initially armed to allow the system operator to leave the monitored area without triggering the alarm. The time delay circuit may be remotely energized to allow a system operator to enter the monitored area for disarming the burglar channel or to allow a system operator to pass through the monitored area without triggering the alarm. The alarm system is shut off in response to a prerecorded signal at the end of the tape or in response to the absence of a recorded signal for a predetermined period of time, should the recording medium fail.



3,582,558
TICKETING CONTROL UNIT

Alexander Jurcazak, Oakbrook, Ill., assignor to International Telephone and Telegraph Corporation

Filed Feb. 19, 1968, Ser. No. 709,858
Int. Cl. H04m *15/04*
U.S. Cl. 179—7.1 **11 Claims**



Ticketing control units, including means for recording date, connect time and disconnect time of telephone calls.

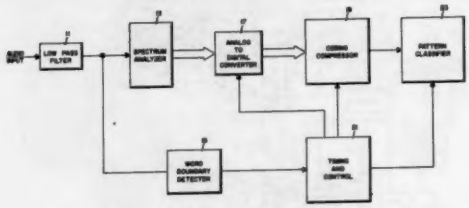
The units also calculate elapsed time of telephone calls, reusing information storage areas used in recording connect and disconnect times to reduce equipment size.

3,582,559

METHOD AND APPARATUS FOR INTERPRETATION OF TIME-VARYING SIGNALS

Myron H. Hitchcock, Reston; Warren L. Holford, Fairfax, and Robert F. Owens, Vienna, all of, Va., assignors to Scope Incorporated, Reston, Va.

Filed Apr. 21, 1969, Ser. No. 817,892
Int. Cl. G10l *1/00*
U.S. Cl. 179—15B **6 Claims**



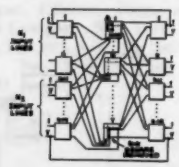
A technique for recoding time-varying signals as a function of the rate of change of those signals to accurately present such data in a format suitable for input to a pattern recognition system. An isolated incoming command signal is sensed and accumulated in its entirety. The command signal is then compressed into a fixed number of pseudospectra. This fixed size pattern is then compared to a set of patterns representing the various command signals the device was trained to recognize.

3,582,560

MULTISTAGE TELEPHONE SWITCHING SYSTEM FOR DIFFERENT PRIORITY USERS

Ralph D. Banks, New York, N.Y., and David M. Mandelbaum, Clifton, N.J., assignors to Communications & Systems, Inc., Paramus, N.J.

Filed Aug. 2, 1968, Ser. No. 749,852
Int. Cl. H04m *3/38*
U.S. Cl. 179—18 **6 Claims**



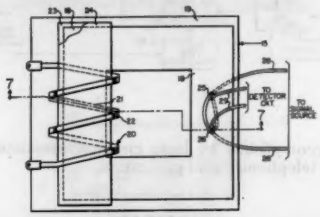
Known switching arrays service subscribers in either a blocking or a totally nonblocking manner. This invention provides modified nonblocking arrays to service group of subscribers, some of which will be given nonblocking service while the rest will be given service at a prescribed blocking probability. The system is illustrated for three- and five-stage symmetrical arrays and may be extended to arrays having a greater number of stages. Any number of subscriber groups can be serviced with different specified blocking probabilities by such arrays, which are called partitioned switching arrays.

3,582,561

PERMALLOY FILM MONITORING DEVICE FOR TELEPHONE LINE CIRCUITS

Martin Dempsey, and John G. Van Bosse, both of Mount Prospect, Ill., assignors to Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Feb. 11, 1969, Ser. No. 798,383
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 **4 Claims**



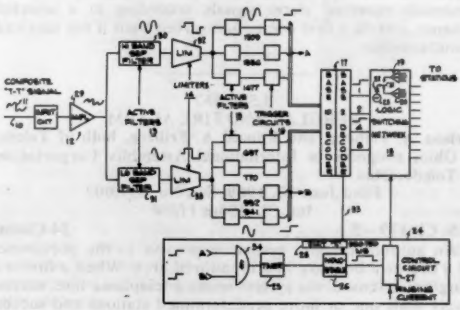
A device for monitoring current in a circuit includes a sheet of saturable magnetic material with a saturation winding, encircling a portion of the sheet, connected in the circuit being monitored for permitting saturation of the magnetic material. A signal source and a detector circuit are each connected to a separate conductive loop which threads apertures formed in the magnetic structure. Whenever the magnetic material is unsaturated, the signal source and the detector circuit are coupled together, with the magnetic material acting as the coupling medium. However, whenever current flows in the monitored circuit and hence in the saturation winding, the magnetic material becomes saturated and the signal source and detector are effectively decoupled. The signal and the detector loops are wound orthogonal to the saturation winding to provide isolation between the circuit being monitored and the monitoring circuits.

3,582,562

KEY TELEPHONE INTERCOMMUNICATION SYSTEM

Daniele Jr. Sellari, Corinth, Miss., assignor to International Telephone and Telegraph, New York, N.Y.

Filed May 7, 1969, Ser. No. 822,549
Int. Cl. H04m *1/00*
U.S. Cl. 179—18AD **6 Claims**



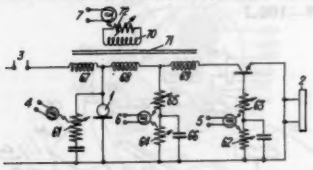
A key telephone system using multifrequency signalling principles to provide two digit selective dialling. On receipt and acceptance of a first digit, a selected one of a first group of lines is rung. If the received digit is a predetermined one (the digit 2 being generally used for this purpose), ringing is inhibited to allow transmission and receipt of a second digit to ring the selected line from a second group of lines.

3,582,563

APPARATUS FOR MATCHING THE IMPEDANCE OF A TELEPHONE SET TO A LINE

William Donald Cragg, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 26, 1967, Ser. No. 693,278
Claims priority, application Great Britain, Jan. 4, 1967, 551/67
Int. Cl. H04m *1/00*
U.S. Cl. 179—81 2 Claims



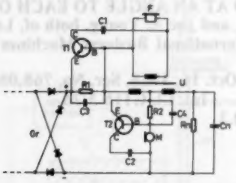
A telephone set is connected to a line via a variable resistance. Line current is used to provide a control signal which adjusts the variable resistance in a manner that matches the impedance of the line. Three embodiments are disclosed using a transistor buffer, a photoresistor, and a thin film device.

3,582,564

CIRCUIT ARRANGEMENT FOR REGULATING THE TRANSMISSION AND RECEPTION REFERENCE EQUIVALENT OF A SUBSCRIBER STATION IN A TELEPHONE SYSTEM

Hans-Ulrich Knauer, Ludwigsburg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 19, 1969, Ser. No. 851,260
Claims priority, application Germany, Aug. 29, 1968, P 17 62 804.5
Int. Cl. H04m *1/58*
U.S. Cl. 179—81 6 Claims



Nonlinear networks in the form of semiconductor switches are employed for separate regulation of reception and transmission in a telephone system to compensate for variations in attenuation. Control of the transistors is made proportional to the voltage drop across separate resistors in the feed loop.

3,582,565

TONE CHANNELS FOR MULTIFREQUENCY RECEIVERS

Robert H. Beeman, River Forest; Robert V. Burns, Tinley Park, and Robert T. Cleary, Lockport, all of, Ill., assignors to Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Jan. 13, 1969, Ser. No. 790,671
Int. Cl. H04m *1/50*; H04q *9/12*
U.S. Cl. 179—84 2 Claims

A tone channel of the type used in multifrequency receivers has in cascade an input band-pass filter that has a frequency curve similar to that of overcoupled filters, a limiter-amplifier, and an output band-pass filter that has narrow band-pass characteristics. The center frequency of both filters is the frequency of a desired incoming tone. After a signal ceases, ringing of the input filter caused by signal is at the peak response points of the input filter at either side of

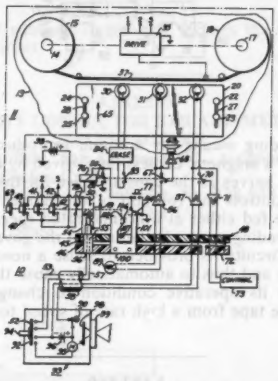
the center frequency, and it is therefore not effective to prolong ringing in the output filter.

3,582,566

SOUND RECORDER CONTROL

Elmer C. Henriksen, Chicago; William J. Pietenpol, Winnetka, Ill., and Arthur Rak, Altadena, Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed June 10, 1968, Ser. No. 735,681
Int. Cl. G03b *31/00*; G11b *5/00*; H01r *33/30*
U.S. Cl. 179—100.2 6 Claims



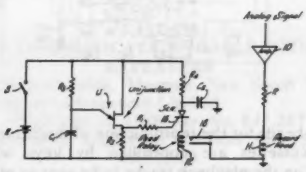
In apparatus for controlling a sound recorder upon actuation of control means remote from said sound recorder, first means for conveying control information from said control means to said sound recorder, said first means being selectively attachable to and detachable from said sound recorder, second means for presetting said sound recorder into a recording mode of operation in response to an operation including an attachment of said first means to said sound recorder, and third means responsive to said control information for operating said sound recorder in a recording mode of operation upon said presetting by said second means and actuation of said control means.

3,582,567

ELIMINATION OF HYSTERESIS EFFECTS IN CARRIER ERASE MAGNETIC RECORDING SYSTEMS

Percy T. Cox, and Albert P. Richter, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 13, 1968, Ser. No. 736,744
Int. Cl. G11b *5/02*, *5/44*, *5/46*
U.S. Cl. 179—100.2 5 Claims



Hysteresis effects in a carrier erase magnetic recording system are eliminated by momentarily short circuiting the

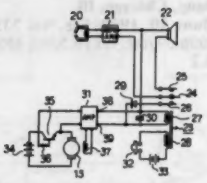
magnetic recording head to induce a damped sinusoidal ringing current in the recording head or, in the alternative, by passing a short burst of direct current thru the recording head in the direction opposite to the normal DC erase current.

3,582,568

TAPE QUICK FEED MEANS FOR A SOUND REPRODUCING APPARATUS UTILIZING A MAGNETIC ENDLESS TAPE

Itsuki Ban, No. 829, Higashi,Oizumi-Machi, Nerima-ku, Tokyo, Japan

Filed Aug. 15, 1968, Ser. No. 752,846
Claims priority, application Japan, Aug. 17, 1967, Sept. 26, 1967, 42/52428;42/61430
Int. Cl. G11b *15/52*; **G05b** *11/01*; **H02p** *7/40*
U.S. Cl. 179—100.2 **7 Claims**



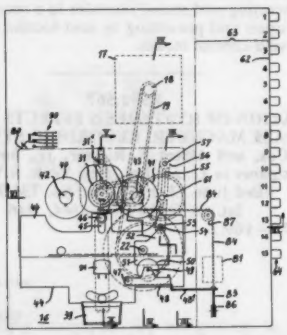
Tape feeding means for a sound reproducing apparatus that utilizes a magnetic endless tape driven by a motor whose rotary shaft serves as the capstan drive for the apparatus. A governor controls the rotation of the motor such that the tape can be fed either at a normal rated speed or at a high speed, depending upon whether or not the governor has been actuated. Circuitry is provided to sense a nonrecorded zone on the tape and thus to automatically cause the governor to switch into its operative condition to change the rate of speed of the tape from a high rate of speed to a normal rate of speed.

3,582,569

SELECTING APPARATUS FOR THE REPRODUCTION OF MULTITRACK MAGNETIC TAPES

Marcel Jules Helene Staar, 479 Avenue Louise, Brussels, Belgium

Filed Aug. 24, 1967, Ser. No. 662,917
Claims priority, application Belgium, Aug. 31, 1966, B.32792
Int. Cl. G11b *15/06, 23/36, 27/20*
U.S. Cl. 179—100.2 **17 Claims**



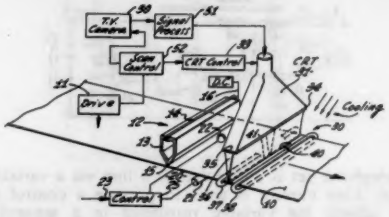
Reading heads for the reproduction of multitrack magnetic tapes in cassettes are controlled by keys which cause recordings on the playback tracks to be sent to playback amplifiers whereas signals on identification tracks are sent to an amplifier which controls a rapid search device to initiate normal playback at proper speed when the signal produced by he the depressed correlates with an indentification signal on the tape.

3,582,570

THEMOMAGNETIC TRANSDUCING SYSTEM

Stanton H. Cushner, Los Angeles, and Alfred M. Nelson, Redondo Beach, both of, Calif., assignors to The Magnovox Company, Torrance, Calif.

Continuation-in-part of application Ser. No. 600,587, Dec. 9, 1966, now abandoned. This application Sept. 5, 1967, Ser. No. 675,266
Int. Cl. G11b *5/02*; **G01d** *15/12*; **H01v** *3/04*
U.S. Cl. 179—100.2 **8 Claims**



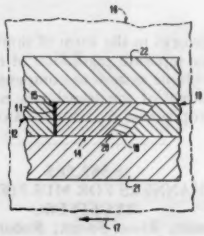
A thin layer of a low Curie point material, such as chromium dioxide, is heated by a focused radiation beam, traveling across the layer. The beam may erase previous magnetization. Preferably a weak, differently oriented magnetic field of below-room temperature coercivity is applied to affect the regions reverting to the ferromagnetic state. An information signal, such as TV signals, is applied to the beam or the weak magnetic field for modulation thereof. In a specific construction the thin layer is magneto optically read from the other side.

3,582,571

MULTIGAP MAGNETIC HEAD HAVING GAPS DISPOSED AT AN ANGLE TO EACH OTHER

Charles N. Sprott, and Joe A. Young, both of, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1968, Ser. No. 768,084
Int. Cl. G11b *5/26*
U.S. Cl. 179—100.2 **7 Claims**

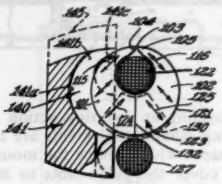


A single magnetic head has the longitudinal axes of a record-playback gap and an erase gap disposed at an angle to each other to reduce erase gap pickup interference during playback. The angle is preferably 45°.

3,582,572
TRANSDUCER HEAD WITH GRAIN ORIENTED SILICON-IRON CORE

Marvin Camras, Glencoe, Ill., assignor to IIT Corporation, Chicago, Ill.

Filed July 22, 1968, Ser. No. 746,651
Int. Cl. G11b *5/16, 5/42;* **H01f** *1/14*
U.S. Cl. 179—100.2 **22 Claims**

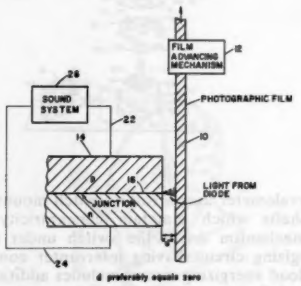


A microgap magnetic transducer head having a core formed of a binary alloy of silicon and iron (preferably from about 3 percent to 7 percent silicon) provides a sharply defined gap of a thickness not more than about one micron, and makes possible a higher magnetic flux saturation density as well as superior wearing qualities as compared with prior magnetic heads, especially for use in a longitudinal scan video transducer system. Advantageous oriented core configurations and core mounting means are also disclosed.

3,582,573
ELECTROLUMINESCENT DIODE WITH 1/E WIDTH OF LESS THAN ONE MIL. AND SOUND RECORDING SYSTEM

Allan S. Miller, Wellesley, Mass., assignor to Norton Research Corporation, Cambridge, Mass.

Filed Dec. 9, 1968, Ser. No. 782,200
Int. Cl. G01d *9/42;* **G11b** *7/12;* **H05b** *33/16*
U.S. Cl. 179—100.3 **2 Claims**



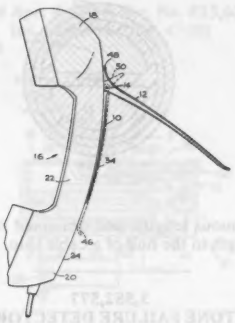
An electroluminescent junction diode having sharply peaked light output is used in conjunction with a sound motion picture camera to record sound on motion picture film. Both the P and N portions of the diode have relatively high absorption coefficients to provide an exponential light output having a 1/*e* width of less than 1.0 mil.

3,582,574
TELEPHONE ATTACHMENT

Mel Grau, 1420 Rising Glen Road, Los Angeles, Calif.

Filed Apr. 21, 1969, Ser. No. 817,851
Int. Cl. H04m *1/04*
U.S. Cl. 179—157 **9 Claims**

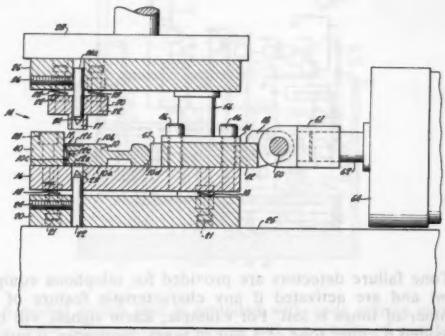
A nonmanual support for a telephone handset. A compactly configured shoulder support element is hinged to, biased toward and encloses a mounting plate. A strip of pressure sensitive adhesive detachably secures the support to a telephone handset.



3,582,575
COMPOSITE CONDUCTOR BAR AND METHOD OF MANUFACTURE

Donald H. Scofield, San Carlos, Calif., assignor to Insul-8-Corp., San Carlos, Calif.

Filed July 2, 1969, Ser. No. 838,558
Int. Cl. B60m *1/30*
U.S. Cl. 191—29DM **13 Claims**



An aluminum conductor bar is provided with a steel cap to form a wearing surface for a slidable current collector. The cap is secured to the bar by simultaneously punching the opposite side legs of the cap to form tabs integral with the cap material which extend into the aluminum to lock the cap securely onto the bar.

3,582,576
TRIPLATE COMMUNICATIONS CABLE WITH BUILT-IN REPEATERS

Antoni Emil Karbowiak, Mosman, New South Wales, Australia, assignor to Unisearch Limited

Filed July 14, 1969, Ser. No. 841,287
Claims priority, application Australia, July 15, 1968, 40,653/68
Int. Cl. H04b *3/36, 3/44*
U.S. Cl. 179—170 **8 Claims**

A cable for transmitting electrical signals over long distances in which repeaters are incorporated in the structure

of the cable during manufacture in the form of microminiature integrated circuits so that the cable can be manufac-

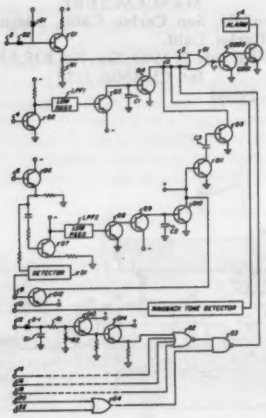
tured in continuous lengths and drummed or deposited as a continuous length in the hull of a cable ship.

3,582,577

TONE FAILURE DETECTORS

Morris Ribner, Chicago, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 21, 1969, Ser. No. 852,030
Int. Cl. H04n *3/22*
U.S. Cl. 179—175.2 **5 Claims**



Tone failure detectors are provided for telephone equipment and are activated if any characteristic feature of a number of tones is lost. For example, alarm signals will be provided if either tone of a pair of tones disappears, if interruptions of tones are lost from tones for which interruptions are required, or if ringing tones are lost.

ERRATUM

For Class 191—24 see:
Patent No. 3,582,575

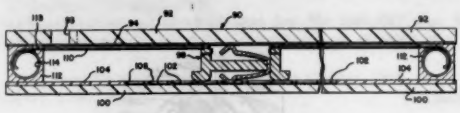
3,582,578

COORDINATE SELECTOR SWITCH WITH TAPE INDICATOR AND COVER

Joseph Larue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 28, 1969, Ser. No. 803,223
Int. Cl. H01h *15/00*
U.S. Cl. 200—16 **9 Claims**

An selector switch is disclosed which features conductive strips mounted on interior surfaces of spaced insulating boards. The strips are oriented in crossing relationship and a contact spring is slidably mounted between the boards so as to selectively contact a pair of crossing strips to provide an interconnection. The top board includes slots which define contact spring travel and allow a spring mounting element to extend above the top board for manipulation. A thin plastic grid is mounted over the lower board which serves a dual function by preventing conductive material of the strips thereon from being smeared to create a short between strips



and also by providing an indexing action for each contact spring. The spring mounting elements are connected to thin flexible plastic tapes which follow the mounting elements in movement and cover the guide slots to minimize entry of foreign particles. Numerals printed on the tape are displayed through a window in the top board to provide symbolic indication of spring contact position.

3,582,579

STEPPING ASSEMBLY AND CIRCUIT

Frederick M. Ford, Carpentersville, and Raymond J. Silhavy, Cary, both of, Ill., assignors to Oak Electro/Netics Corporation

Filed May 22, 1969, Ser. No. 826,894
Int. Cl. H01h *3/00*
U.S. Cl. 200—18 **6 Claims**

An intervalometer uses a rotary switch mounted to a base through shafts which maintain concentricity. An offset stepping mechanism drives the switch under control of a drive energizing circuit having interrupter contacts on the switch. A load energizing circuit includes additional contacts on the switch for sequentially energizing a plurality of independent loads, while shunting all nonenergized loads. Separate switch sections separate the drive energizing circuit from the load energizing circuit. When the switch is in a home position, it must be manually rotated to another position before automatic sequential stepping can occur.

3,582,580

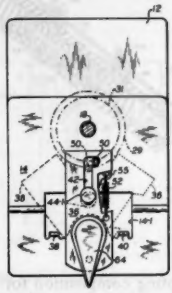
AUTOMATIC CYCLE TIMER WITH MANUAL DEFEAT FEATURE

James A. Drachi, Manchester, Conn., assignor to M. H. Rhodes Inc., Hartford, Conn.

Filed Nov. 13, 1968, Ser. No. 775,430
Int. Cl. H01h *7/08, 43/10*
U.S. Cl. 200—38 **7 Claims**

An automatic cycle timer has a switch for controlling an external appliance. The switch is opened and closed automatically at predetermined times by a drive mechanism powered by an electric motor which has its own energizing

circuit not controlled by the switch for the external appliance. The drive mechanism includes a reduction gear train which revolves a pair of cams, one for closing and the other for opening the switch. The cams do not engage the switch button directly, but instead move an actuator element which rides toggle fashion in an L-shaped slot formed in a mode selector element. When the mode selector is in a neutral position, the actuator determines the condition of the switch



and the operation of the cycle timer is fully automatic; i.e. under the control of the motor-driven mechanism. But when the mode selector element is manually switched to another position it closes the switch, and in still another position it opens the switch, in either case without regard to the position of the actuator or the motor-driven mechanism. Thus manual manipulation of the mode selector takes precedence over automatic operation, but the operation of the motor is not thereby interrupted.

3,582,581

TIMING DEVICE WITH IMPROVED NON-CONDUCTIVE PROGRAMMING MEANS

Thomas R. Hawks, 801 E. 37th St., Long Beach, Calif.

Filed Aug. 22, 1969, Ser. No. 852,428
Int. Cl. H01h *43/18, 43/08*
U.S. Cl. 200—38 **7 Claims**

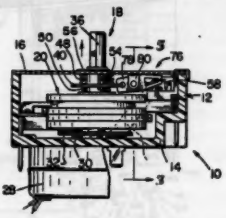
A timing device that may be selectively set to automatically actuate an alarm or other electrically operated device, at the expiration of a predetermined number of seconds, minutes, or hours by the combined operation of a selected, rotatably driven arm and a nonelectrical conducting film. The film may be selectively matched on the circumferential edge thereof, with the spacing between the notches determining the relative time intervals between actuation of the alarm, or other electrically operated device, and with the width of the notches being the limiting factor as to the length of time the alarm, or other electrically operated device, will be energized. The time intervals between the periods of energization of the alarm, or other electrically operated device, is also determined by the speed at which the arm is rotated, as is the duration of each of said periods.

3,582,582

TIMER UTILIZING MOMENTARY SWITCH OPERABLE FROM SEGMENTED TIMER SHAFT

Kurt Pauker, and Joseph E. Wiser, both of, Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Apr. 4, 1969, Ser. No. 813,620
Int. Cl. H01h *7/08, 43/00*
U.S. Cl. 200—38 **6 Claims**



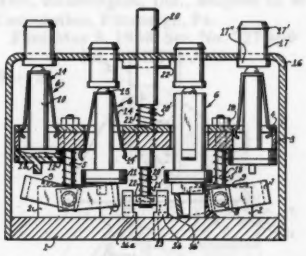
The "push or pull" of a segmented shaft means which carries a cam means for actuating switches responsive to cams, actuates an actuator means which in turn actuates a contact blade to open and close electrical contacts. The shaft segments are coupled together through spring washer means. One segment carries the cam means, while the other segment axially moves to actuate the actuator means.

3,582,583

CODED SWITCH

Stephen Paterson, 4 Dartmouth St., Forest Hills, N.Y.

Filed Dec. 15, 1969, Ser. No. 885,195
Int. Cl. H01h *27/10*
U.S. Cl. 200—43 **20 Claims**



A coded switch unit is provided with code setting means adjustable between two positions and a plurality of pushbutton actuated operating means also adjustable between two positions and cooperating with contact means in such a manner that depending upon the adjusted position of the code setting means and the operating means, closing of a circuit connected to the switch will require actuation of operating means set in one position, whereas actuation of any operating means set in the other position will prevent closing of the circuit.

3,582,584

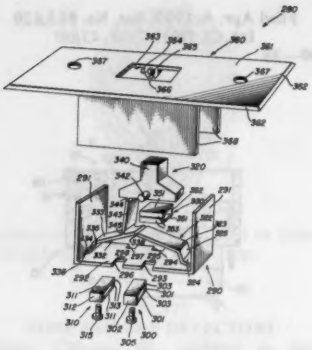
ELECTRICAL SWITCH HAVING INTEGRAL PLASTIC PARTS

Aaron R. Best, Wheeling, Ill., assignor to Nibot Corporation, Chicago, Ill.

Filed Aug. 19, 1968, Ser. No. 753,568
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 **4 Claims**

There is disclosed an electrical switch including a plastic housing having a fixed electrical contact mounted therein, an integral plastic actuator including a pair of arms hingedly joined together and a handle for controlling the position of the arms, the outer ends of the arms being respectively

swingably connected to the housing at spaced-apart mounting points thereon for snap movement between first and second stable conditions, and a movable electrical contact



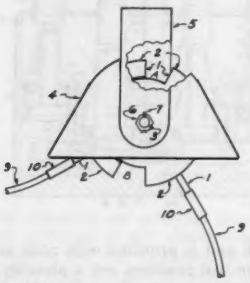
held against the fixed electrical contact when the arms are in the first stable condition and being held away from the first electrical contact when the arms are in the second stable condition.

3,582,585

SAFETY OF ELECTRIC TRANSMISSION AND DISTRIBUTION

Guy Otis Stenstrom, Jr., Country Lane at Lake Sten, RFD #1, Sanford, Fla.

Filed June 25, 1968, Ser. No. 740,839
Int. Cl. H01h *3/16*
U.S. Cl. 200—79 **2 Claims**



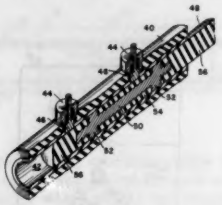
A supporting dielectric body containing conductors to which the adjacent ends of consecutive spans of an electric line are connected. The conductors, having matched contacts, are each rotatably secured by an insulative member to an adequate axle which is rigidly affixed within the body in such a manner as to amplify the tension of the supported lines and use that amplified force to hold the matched contacts securely together thereby providing for the uninterrupted flow of electricity from one span through a conductor, thence through the matched contacts, thence through the companion conductor and into the next sequential span only so long as the spans are supported. In the event of severance of a span so supported negating the tension therein, the conductors attached to the broken span will then automatically rotate vertically about the axle, separating the matched contacts a controlled distance during the interval of free fall of the broken span thereby disconnecting it from the power supply during which time there is relatively no flow of electricity, thus rendering it dead.

3,582,586

ARC-INTERRUPTING MATERIALS AND APPARATUS

Paul W. Jones, Lafayette, Ind., assignor to Rostone Corporation, Lafayette, Ind.

Filed Mar. 21, 1966, Ser. No. 536,119
Int. Cl. H01h *33/70, 9/30*
U.S. Cl. 200—144 **1 Claim**



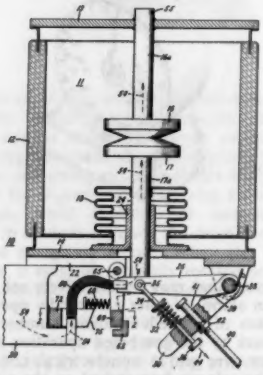
An arc-interrupting composition for the walls of electrical circuit interrupting devices to improve the characteristics of such device for interrupting high power circuits. The composition comprises melamine, and a thermoplastic organic binder which is more reactive to arcing than the melamine and under arcing conditions vaporizes or decomposes violently to drive the more stable melamine into the arc and thereby render the melamine effective. Improved effectiveness of the composition over a range or for particular applications may be obtained by adding other components, including melamine-formaldehyde resin, hydrated alumina, and fillers such as silica or aluminum fluoride.

3,582,587

VACUUM-TYPE CIRCUIT INTERRUPTER HAVING A STROKE LENGTH DEPENDENT UPON CURRENT MAGNITUDE

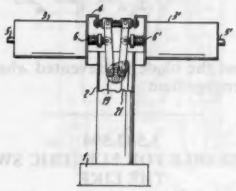
Philip Barkan, Media, Pa., assignor to General Electric Company

Filed Feb. 3, 1969, Ser. No. 796,062
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 **5 Claims**



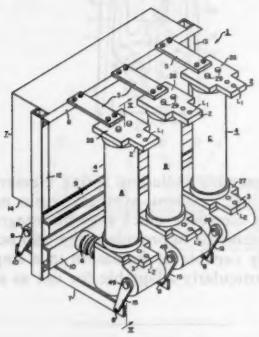
Discloses a vacuum-type circuit interrupter comprising current-responsive means for varying its opening stroke length in accordance with the magnitude of the current being interrupted.

3,582,588
MOTION TRANSLATING MEANS
Charles Andre Cichocki; Edouard Mancini, and Gustave Sutter, all of Petit-Lancy, Switzerland, assignors to Societe Anonyme de Participations Appareillage Gardy, Neuchatel, Switzerland
Filed June 4, 1969, Ser. No. 830,347
Claims priority, application Switzerland, June 13, 1968, 8803/68
Int. Cl. H01h 33/66
U.S. Cl. 200—144 11 Claims



The invention relates to actuating mechanism for moving switch contacts to thereby open and close a circuit in a vacuum envelope. The actuating mechanism includes an oscillatable lobe associated with pivotal lever means which when motivated cause the contacts in the vacuum envelope to open and close.

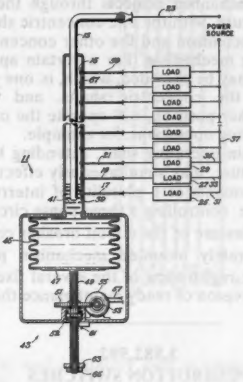
3,582,589
FLUID-BLAST CIRCUIT INTERRUPTER WITH PISTON ASSEMBLY AND ELECTROMAGNETIC DRIVING MEANS
Russell E. Frink, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 30, 1968, Ser. No. 701,771
Int. Cl. H01h 33/91
U.S. Cl. 200—148 12 Claims



A fluid-blast piston-type circuit interrupter utilizes two stationary accelerating coils and one moving accelerating coil carried by a fluid-driving piston assembly. During the opening operation, the series fault current is inserted serially into the three accelerating coils, and their magnetic attraction and repulsion forces assist the operating mechanism to move the fluid-driving piston assembly, and thereby to drive fluid, such as sulfur-hexafluoride (SF_6) gas, through the established arc drawn within an orifice member to effect its extinction.

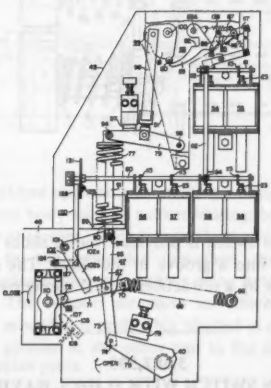
3,582,590
SEQUENTIAL SWITCH DEVICES
Marcus P. Eubank, 902 S. Martin St., Kilgore, Tex.
Filed Mar. 14, 1969, Ser. No. 807,262
Int. Cl. H01h 29/00
U.S. Cl. 200—152 7 Claims

This specification discloses an electric switch characterized by a main electrode having the general form of an elongate member for connecting with one side of a power supply; a plurality of contacts having leads for connecting through loads to another side of the power supply, with the contacts being disposed linearly along, spaced from and closely adjacent the main electrode. The main electrode and the plu-



rality of contacts are disposed within a container having a supply of mercury therein. There is provided means for sequentially immersing the respective contacts and adjacent portions of the main electrode in the mercury such that load elements may be sequentially connected to a power source. Various embodiments are also described.

3,582,591
QUICK-OPENING AND QUICK-CLOSING CIRCUIT BREAKER WITH TOGGLE ACTION, AND A CONCENTRIC DOUBLE SHAFT
Robert A. Few, Bloomington, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 8, 1968, Ser. No. 727,409
Int. Cl. H01h 3/46
U.S. Cl. 200—153 20 Claims



A quick-opening and quick-closing circuit breaker is provided having a high-speed operating mechanism including a closing spring and an opening spring. A crank arm operator is provided to tension both the closing and opening springs, so that by the rotation of a driving crank mechanism, a charging of the closing spring and a simultaneous charging of the opening spring takes place. Upon the attainment of a one-half revolution of the driving rotatable operator, the opening spring is tensioned and latched, and the closing spring is permitted to contract and quickly effect closing of the operating mechanism, while at the same time maintaining the latched condition of the charged opening spring.

Tipping means is provided for releasing the latching of the charged opening spring, either by manual or electrical tripping, and upon the actuation of the tripping means, the latching means of the opening spring is released to effect a quick-opening operation of the circuit breaker.

A housing construction is provided, particularly adaptable for submersible applications, wherein a concentric crank-arm-operating mechanism projects through the sidewall of the housing structure, with the one concentric shaft actuating the crank arm mechanism and the other concentric shaft actuating a tripping mechanism. For a certain application, an operating wheel may be provided, which, in one position, will actuate one of the concentric shafts, and which when reversed to its other position, will operate the other concentric shaft for tripping operations, for example.

A rotatable main operating shaft, extending lengthwise of the breaker structure, may simultaneously effect the opening and closing movements of a plurality of interrupting structures, for example, controlling a three-phase circuit.

An additional feature of the circuit breaker construction is the use of separately mounted mechanism plates, which result in accurate registration of the several fixed-shaft positions, and the provision of ready maintenance therefor.

3,582,592

PUSHBUTTON SWITCHES

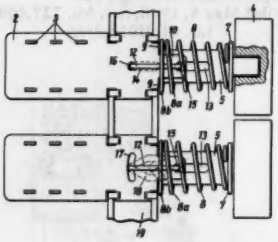
Rudolf Schadow, Konigsbacher Zeile 23, Berlin-Frohnau, Germany

Filed Feb. 4, 1969, Ser. No. 796,516

Claims priority, application Germany, Feb. 21, 1968, June 10, 1968, P1,690,203;P1,765,562

Int. Cl. H01h *13/14, 13/56, 13/52*

U.S. Cl. 200—159 **13 Claims**



A pushbutton switch is provided with a slider with a stop part extending into a groove in the slider. The stop part is held in position by a retractible helical spring parallel to the slider.

3,582,593

PUSHBUTTON SWITCH WITH SLIDES, HAVING SCRUB ACTION BETWEEN CONTACTS

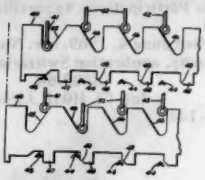
George C. Mapelsden, Easton, Conn., assignor to General Electric Company

Continuation-in-part of application Ser. No. 721,697, Apr. 16, 1968. This application Dec. 12, 1969, Ser. No. 884,639

Int. Cl. H01h *1/36, 3/42*

U.S. Cl. 200—164 **6 Claims**

A pushbutton switch having at least one slider operated by a pushbutton. The slider has a projection to engage a blade carrying a movable contact and move the blade and the movable contact whereby a scrubbing action is provided between the movable contact and a stationary contact when the two contacts are in engagement. The projection is beveled adjacent its distal end so that engagement between



the projection and the blade is prevented when the two contacts are not in engagement.

3,582,594

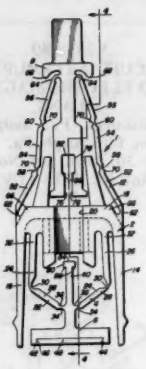
ACTUATOR USEABLE FOR ELECTRIC SWITCHES AND THE LIKE

Robert H. Twyford, Falls Church, Va., assignor to Mechanical Enterprises Incorporated

Filed Nov. 15, 1968, Ser. No. 776,148

Int. Cl. H01h *3/12*

U.S. Cl. 200—172 **26 Claims**



An actuator assembly including spring elements unitarily formed of a flexible, resilient, synthetic resin material and driver and driven members which may be integrally formed with said spring elements to provide a new and novel integral actuator assembly capable of formation in a single molding operation and particularly adaptable for use as an electrical switch.

3,582,595

TRIP-FREE SWITCH-OPERATING MECHANISM

Manfred Stene, Chicago, Ill., assignor to Erickson Electrical Equipment Co., Chicago, Ill.

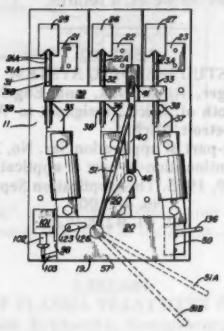
Filed Oct. 31, 1969, Ser. No. 872,953

Int. Cl. H01h *3/30, 3/54, 21/42*

U.S. Cl. 200—153 **9 Claims**

A trip-free operating mechanism for a manual load break switch using an overcenter spring drive to open and to close the switch. On closing, the switch handle actuates the overcenter spring drive and charges a switch-opening spring, or other storage device, through an actuating mechanism that automatically latches both the opening spring and the handle as closed position is reached. An independent trip, which may be electrically operated by a solenoid and may also be manually operated, releases the opening spring to power the spring drive for opening of the switch; after the switch opens, the handle is released to fall freely to its open-switch position, serving as an external switch position indicator. The handle is not used directly to open the switch, but can be

used as a means for manual operation of the trip mechanism; the handle can be moved to its fully open position only when



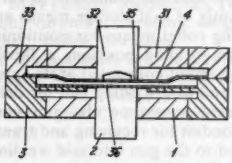
the switch is fully open, and hence can be utilized in a safety interlock to prevent exposure of live switch parts.

3,582,596

DIAPHRAGM PUSHBUTTON SWITCHES

Harry Stanley Woodhead, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 15, 1969, Ser. No. 824,989
Claims priority, application Great Britain, May 17, 1968, 23493/68
Int. Cl. H01b *13/00*
U.S. Cl. 200—159 **22 Claims**



Pushbutton diaphragm switches are provided. Switch contacts in a hermetically sealed environment are energized by changes in magnetic fields caused by motion of a permanent magnet under control of a pushbutton. A pushbutton spring may be dispensed with and magnetic attraction may be relied upon to provide the necessary restoring force.

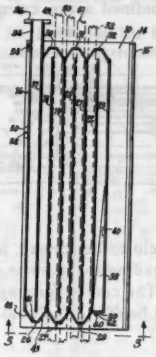
3,582,597

MICROWAVE FILM DRYER

Peter H. Smith, Chicago, Ill., assignor to Reeve Electronics, Inc., Chicago, Ill.

Filed Aug. 4, 1969, Ser. No. 847,143
Int. Cl. H05b *9/06, 5/00*
U.S. Cl. 219—10.55 **10 Claims**

This disclosure relates to apparatus for drying photographic film, following developing, with microwave energy. The film is supported for movement, during spaced time intervals, through a plurality of portions of an extended waveguide, and a dummy load is located at the end of the waveguide.

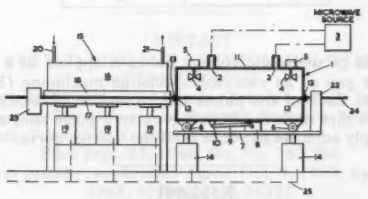


3,582,598

METHODS AND APPARATUS FOR HEATING A BODY CONVEYOR SYSTEM FOR HEATING BODIES BY A MICROWAVE CAVITY

Peter Astley Wincott, Luton, England, assignor to The English Electric Company Limited, London, England

Filed Dec. 9, 1968, Ser. No. 782,389
Claims priority, application Great Britain, Dec. 9, 1967, 56105/67
Int. Cl. H05b *5/00, 9/06*
U.S. Cl. 219—10.69 **2 Claims**



Method and apparatus for heating a body, especially a long continuous body such as rubber belting, by microwave heating in an enclosure which is moved relative to the body being heated. In the examples described this is done by a reciprocating device, the belting being held stationary during heating. The support structure on which the enclosure is movably mounted is preferably pivoted at one end on a fixed axis and pivoted at the other end to the moving platen of a vulcanization press.

3,582,599

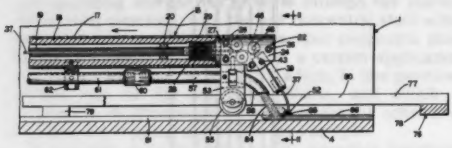
INTERNAL WELDING TOOL

Melvin G. Yohn, Canton, Ohio, assignor to McKenzie-Ris Mfg. Corp., Missillon, Ohio

Filed July 29, 1968, Ser. No. 748,311
Int. Cl. B23k *9/02*
U.S. Cl. 219—60 **8 Claims**

A welding head construction for use with typical traveling head automatic welding equipment to form submerged or shielded arc welds internally in confined spaces too small to receive the usual welding head of the equipment and where

the welding operation and its progress cannot be observed visually. The internal welding head is provided with forming rolls which impart a curve to the weld wire or rod fed to the submerged weld-arc location. The internal welding head in order to enter a confined space extends parallel with and



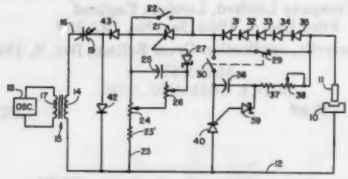
very close to the weld to be formed, and the weld rod and shielding material feed means likewise extend parallel to the weld to be formed. The curved forming of the weld rod enables the weld rod to be fed to the weld-arc location substantially perpendicularly.

3,582,600

METHOD AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING BY FORE AND/OR AFT SHORTENED VOLTAGE INPUTS

Harry D. Kauffman, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Feb. 17, 1969, Ser. No. 799,597
Int. Cl. B23p *1/00*
U.S. Cl. 219—69 **29 Claims**



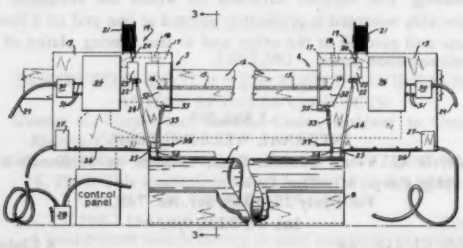
A series of sinusoidal voltage pulses is applied to a spark discharge gap of an electrical discharge machining (EDM) apparatus. Each of the pulses is fore and/or aft blocked or cut off so that each resultant gap current pulse rises and/or falls steeply adjacent to the peak of the voltage curve.

3,582,601

PROCESS FOR SUBMERGED ARC WELDING

George R. Wepfer, Wauwatosa, and Bertil G. Winstrom, Mequon, both of, Wis., assignors to A. O. Smith Corporation of Texas, Houston, Tex.

Filed Jan. 26, 1970, Ser. No. 5,510
Int. Cl. B23k *9/18*
U.S. Cl. 219—73 **6 Claims**



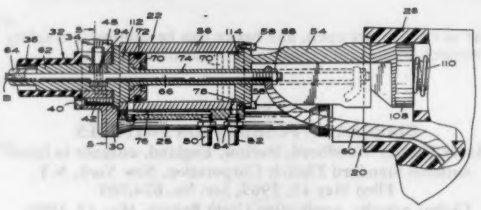
A submerged arc-welding process performed on adjacent longitudinal edges of a pipe blank. Two submerged arc-welding units are supported on carriages which move on a stationary travel beam over the pipe blank. The welding units start welding at opposite ends of the longitudinal edges and weld toward each other until they meet. At that time one welding unit stops and returns while the second continues forward to overlap the welds while the fused flux remains electrically conductive at the area of overlap. After the second unit merges the welds, it returns.

3,582,602

STUD WELDING SYSTEM

Donald H. Ettinger, Royal Oak, and Engelbert A. Meyer, Union Lake, both of, Mich., assignors to Warren Fastener Corporation, Detroit, Mich.

Continuation-in-part of application Ser. No. 378,507, June 29, 1964, Continuation-in-part of application Ser. No. 451,958, Apr. 29, 1965. This application Sept. 3, 1965, Ser. No. 485,007
Int. Cl. B23k *9/20*
U.S. Cl. 219—98 **6 Claims**



1. An automatic, portable-gun system for repetitively welding relatively small components to panel surfaces, comprising, in combination: storage means for containing a supply of components to be welded; pneumatic feeding means for receiving components from the storage means and propelling one component at a time to the gun; a portable welding gun operable remote from and manipulatable to various welding positions independently of said storage means and said feeding means and having collet means for positioning and holding a component in welding position; a flexible elongate pneumatic delivery conduit connected at its opposite ends to said feeding means and said welding gun for delivering components therebetween; means on the gun communicating with said delivery conduit for receiving and transferring each component delivered to the gun into said welding position in the collet; a source of welding current connected to the gun; and control means connected to said feeding means and to said source of welding current and including a part on the gun operable to initiate automatic cycling operation of the system to cause welding of a component in the collet to a panel surface and delivery of the next component to the collet preparatory to the next welding cycle.

3,582,603

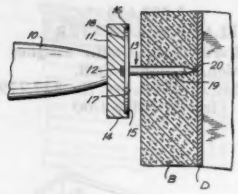
METHOD AND APPARATUS FOR ATTACHING INSULATION TO DUCT WORK

Milton Hinden, 15 Bay Link, Massapequa, N.Y.

Filed Feb. 7, 1969, Ser. No. 797,603
Int. Cl. B23k *9/20*
U.S. Cl. 219—99 **6 Claims**

A resistance welding method for attaching insulating batts to metal duct work using a welding pin having a head of large cross-sectional area and a shank having a turned, lathe sharpened tip. The head portion of the pin is contacted by an enlarged electrode defining a heat sink. The sharpened tip of the pin is advanced through the insulating batt into contact with the duct. Welding current is passed from the electrode

through the shank and duct while the tip is continuously pressed against the duct. The sharpened tip is formed to an



angle of 45° to 50°. The cross-sectional area of the head is at least 20 times greater than that of the shank.

3,582,604

METHOD OF PLASMA TREATMENT OF METALS

David Grigorievich Bykhovsky, Konjushenny per., 1/6, Kv. 18; Alexandr Ivanovich Danilov, V.O. 16 linia, 79, Kv. 15; Alexandr Yakovlevich Medvedev, Kalyaeva, 3, Kv. 17, and Mikhail Gershenovich Fridlyand, Ganguts Kaya ul., 6, Kv. 9, all of Leningrad, U.S.S.R.

Filed Jan. 17, 1969, Ser. No. 792,148

Int. Cl. B23k *9/00*

U.S. Cl. 219—121 **5 Claims**

A method is provided for plasma treatment of metals without removing the material from the treatment area (for example, welding, surfaceremelting, surfacing and the like) by a transfer plasma arc burning between the plasmatron electrode and the metal being treated, one of the electrode areas of the arc being located on said metal. The method consists in that the plasma treatment is carried out in a layer of flux and plasma is produced from a gas mixture comprising components having considerably different values of heat conductivity at arc temperatures. The component with the relatively high heat conductivity is hydrogen, helium or nitrogen, and the component with the relatively low heat conductively is neon, argon, xenon, krypton or nitrogen.

3,582,605

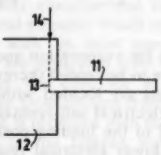
METHOD FOR WELDING METAL PARTS HAVING DIFFERENT CROSS SECTIONS

Hans Lamatsch, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Continuation of application Ser. No. 614,893, Feb. 9, 1967, now abandoned. This application July 16, 1969, Ser. No. 846,635

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 **3 Claims**



A recess is formed in one metal part corresponding in cross section to another metal part at a location of the first-mentioned metal part at which the other metal part is to be connected. The other metal part is then snugly inserted in the recess, and an electron beam is applied to the parts parallel to the plane of engagement between both parts so as to connect the parts by butt welding.

3,582,606

GAS-SHIELDED CONSUMABLE ELECTRODE ARC WELDING

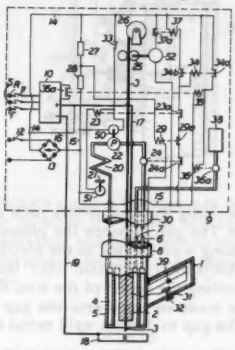
Jan-Erik Henriksen, and Klas Bertil Weman, both of Laxa, Sweden, assignors to Elecktriska Svetsningaktiebolaget, Gothenburg, Sweden

Filed June 30, 1969, Ser. No. 837,439

Claims priority, application Switzerland, July 8, 1968, 9358/68

Int. Cl. B23k *9/00*

U.S. Cl. 219—130 **13 Claims**



In gas-shielded arc welding with a fusible electrode which is pushed by a motor-driven wire advancing mechanism towards the workpiece through a guide and contact member serving to transmit the welding current to the electrode, said guide and contact member being surrounded by a shielding gas nozzle electrically insulated from said guide and contact member, the insulation resistance between said guide and contact member and said shielding gas nozzle is monitored to provide an output signal when said resistance is lower than a predetermined magnitude.

3,582,607

ARC WELDING FOR CONTROLLING WELD PENETRATION

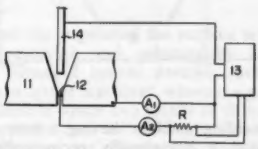
Michio Inagaki, and Akira Okada, Tokyo, both of, Japan, assignors to The Director of National Research Institute for Metals, Tomoyoshi Kawada, Tokyo, Japan

Filed Sept. 25, 1968, Ser. No. 762,384

Claims priority, application Japan, Oct. 9, 1967, Apr. 13, 1968, 42/64633;42/24322

Int. Cl. B23k *9/00*

U.S. Cl. 219—137 **7 Claims**

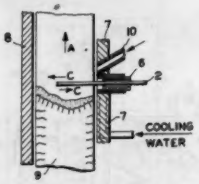


An arc-welding process and apparatus are disclosed in which melting conditions and depth of penetration of the arc are detected to permit control of the welding current, welding speed and the like. An insulated electrode, or conductor, is provided connected at one end to the power supply terminal connected to the workpiece, the electrode being disposed within or adjacent to the edges to be welded. An ammeter connected in series with the electrode provides a reading of the shunt current as the welding arc approaches and reaches the electrode, the shunt current providing the means for controlling the welding current, welding speed, and the like.

3,582,608
METHOD OF ARC WELDING THICK MEMBERS BY RECIPROCATION OF A WELDING WIRE ELECTRODE

Teiji Ito; Takeshi Nishi; Tetsuya Hidaka, and Tsurugi Kimura, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of application Ser. No. 618,215, Feb. 23, 1967. This application Nov. 20, 1969, Ser. No. 878,387
Int. Cl. B23k 9/00
U.S. Cl. 219—137 5 Claims

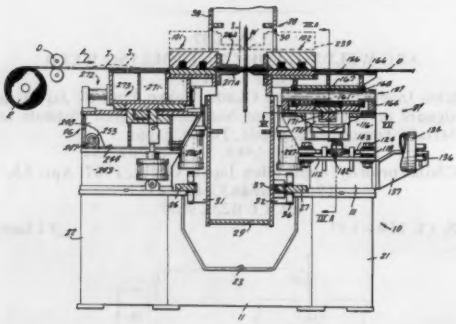


A method of welding thick members such as plates in the vertical direction. The gap between the plates is made small, and only the welding wire serving as the electrode is inserted in a generally horizontal direction into the gap. By appropriately controlling the speed of the wire feed means, the tip of the wire is made to transverse the gap as it is moved upwardly along the gap to deposit weld metal in the gap.

3,582,609
MAGNETIC CLAMP CONSTRUCTION

John D. Morley, Bay City, and William F. Salbenblatt, Saginaw, both of, Mich., assignors to Newcor, Inc., Bay City, Mich.

Division of Ser. No. 553,971, May 31, 1966, Pat. No. 3,511,961. Filed Oct. 24, 1968, Ser. No. 790,186
Int. Cl. B21j 13/08
U.S. Cl. 219—161 6 Claims

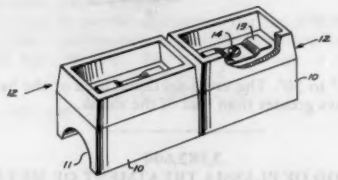


A strip end welding machine having a base on which is slideably mounted a horizontally reciprocating, annular frame. The strips whose ends are to be welded pass axially through the frame transversely of its direction of reciprocation. The frame carries a shear for trimming the ends of the strips to be welded and welding and planishing rolls energizable for joining the overlap strip ends. The machine includes base-mounted clamps on either side of the frame for gripping the strip ends to be joined. The clamps are spaced from the welding zone and include a clamp bed of magnetic material and a magnet disposed opposite the clamp bed to clamp a strip therebetween. Each of the clamp bed and magnet are provided with a nose made of nonmagnetic material, which noses project away therefrom towards the welding zone. Each of the noses has a guiding surface thereon, each of said guiding surfaces being offset back from the adjacent clamping surface of the clamp bed and magnet a distance such that the distance between said guiding surface is greater than the thickness of the strip but close enough to prevent a buckling of the portion of the strip extending from the clamp bed and magnet to the welding zone.

3,582,610
FLAT PACK HEATER

Paul N. Eckles, Carmichael, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed May 26, 1969, Ser. No. 827,779
Int. Cl. H05b 1/00
U.S. Cl. 219—209 4 Claims

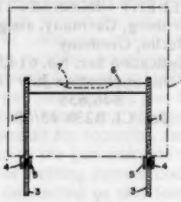


Flat packs are soldered to circuit boards by holding their flat terminal tabs to the mating parts of the circuit on the board after solder has been applied to the parts of the tabs adjacent the board, and the opposite sides of the tabs are pressed against a heated rim or rims of a heater long enough to reflow the solder so that the solder from each terminal tab envelops its mating part on the circuit board, after which the terminal tabs are moved out of heating relationship with the hot rim to allow the solder to cool and solidify.

3,582,611
APPARATUS AND METHOD OF METAL EVAPORATION INCLUDING AN EVAPORATION BOAT HAVING LOWER ELECTRICAL RESISTIVITY ENDS THAN THE CENTER THEREOF

Wilfrid G. Matheson, Marblehead, and Edmund M. Passmore, Wilmington, both of, Mass., assignors to Sylvania Electric Products Inc.

Filed Nov. 24, 1969, Ser. No. 879,192
Int. Cl. F22b 1/28
U.S. Cl. 219—271 7 Claims



In an apparatus for evaporation and vacuum deposition of metal on an article to be coated therewith, spaced-apart electrical binding posts are located within a vacuum chamber. The ends of an electrical self-resistance-heated evaporation boat are clamped to the binding posts. The end portions of the boat have a lower electrical resistivity than the center portion in order to minimize contact resistance and to reduce power dissipation at the ends of the boats.

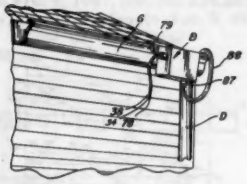
3,582,612
AUTOMATIC ELECTROLYTIC DEVICE TO LIMIT ICE FORMATION IN GUTTERS AND DOWNSPOUTS

Roman Siemianowski, 1647 N. Pauline St., Chicago, Ill.

Filed Mar. 21, 1969, Ser. No. 818,170
Int. Cl. H05b 1/00
U.S. Cl. 219—213 16 Claims

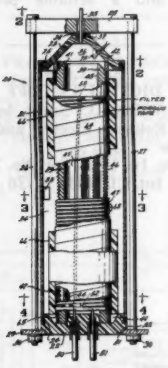
A water-sensing switch which energizes heating cables or tapes placed in gutters and downspouts to prevent ice over-

flow, which switch is part of a circuit including a transformer, a relay, a circuit breaker and a current supply to said gutters and downspouts.



The present invention is directed to an electrolytic switch and associated electrical means, which is an improvement on the switch means and associated structures shown in my U.S. Pat. No. 3,233,078, granted Feb. 1, 1966.

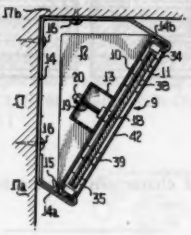
3,582,613
FLUID-HEATING DEVICE
Othmar W. Pies, 200 W. Galbraith Road, Cincinnati, Ohio
Filed Oct. 11, 1968, Ser. No. 766,789
Int. Cl. F24h *3/00*
U.S. Cl. 219—307 **7 Claims**



A fluid-heating device comprising a casing, outer and inner chambers therein, a hollow metal core about which spaced turns of Teflon-coated wire is wound and which wire constitutes a heater for raising the temperature of fluid flowing into the inner chamber to a preset range of temperature, a thermistor for sensing temperature of fluid discharged at the top of and from the inner chamber and being adapted for connection to an electrical circuitry which opens and closes a fluid valve associated with an inlet port for the outer chamber. The changers are separated from each other and a filter is provided about the core for preventing foreign material, dirt and the like from passing from the outer to the inner chamber. The core is provided with fluted passageways for upward circulation of the filtered water in the inner chamber.

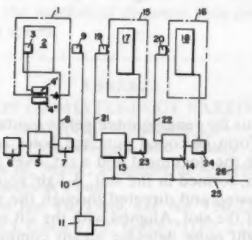
3,582,614
RADIANT HEATING MODULE
Mabel W. Zellers, 900 Center Ave., Reading, Pa.
Filed Nov. 3, 1967, Ser. No. 680,419
Int. Cl. H05b *3/20*; **F24h** *9/08*
U.S. Cl. 219—345 **3 Claims**

A radiant heating module has an electrical radiant heating panel mounted within a casing in spaced relation to the back wall thereof in order to prevent deleterious heat buildup by allowing air movement therebetween. A channel-shaped raceway coextensive in length with the casing is mounted on the side of the casing backwall opposite the panel to protect the power supply wires for the panel. Triangular-shaped end plates are provided on the casing for closing the ends of the raceway and to provide a guide for attaching the casing at an acute angle onto a sidewall along the ceiling level at the cove



of the room. Brackets support the casing in such manner that air can circulate between the casing, ceiling and sidewall to prevent deleterious heat buildup. The end plates are removable to allow a plurality of modules to be placed end to end to form an assembly.

3,582,615
ARRANGEMENT FOR REGULATING THE SURFACE TEMPERATURE OF SEVERAL SIMILAR HEATED DEVICES
Heinz Schippers, and Gerhard Martens, both of Remscheid-Lennep, Germany, assignors to Barmag Barmer Maschinenfabrik AG., Wuppertal, Germany
Filed Dec. 17, 1969, Ser. No. 885,899
Claims priority, application Germany, Dec. 24, 1968, 1,816,935
Int. Cl. H05b *1/02*
U.S. Cl. 219—471 **7 Claims**

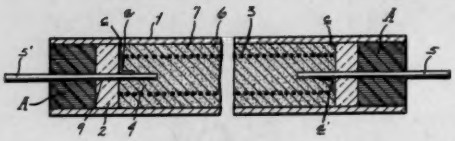


An apparatus for regulating the surface temperature of a plurality of revolving and substantially identically constructed and arranged heated devices, such as godets or thread rollers in textile machines, wherein a guide or monitor godet is provided in which two means of detecting and transmitting temperature data are used in conjunction with each other as a reference for effectively controlling the surface temperature of all other heated godets in the system.

3,582,616
ELECTRICAL HEATERS
Ronald M. Wrob, Sunset Hills, Mo., assignor to Watlow Electric Manufacturing Co., St. Louis, Mo.
Filed Oct. 29, 1968, Ser. No. 771,468
Int. Cl. H05b *3/08*
U.S. Cl. 219—541 **24 Claims**

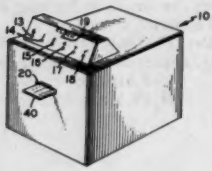
Electrical heaters having an outer metal sheath within which is a resistance element, conductors being in electrical contact with said element and projecting outwardly of said sheath for connection to a power source; said resistance element being surrounded by electrically insulating, heat-conductive material capable of withstanding relatively elevated

temperatures, and hermetic seals provided at the ends of said sheath formed of swageable material capable of retention of



inherent physical characteristics at substantially high temperatures.

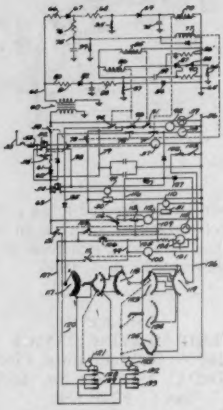
3,582,617
CODED PUNCHED HOLE DOCUMENT READER
Robert M. Berler, Westport, Conn., assignor to Pitney Bowes-Alpex, Inc., Danbury, Conn.
Filed Jan. 31, 1969, Ser. No. 795,632
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.11E **3 Claims**



An apparatus for reading intelligence contained on a document in the form of coded punched holes which includes a slot to receive the document and a slit, over which the document is drawn, formed in the slot. A light source wherein the light is collimated and directed through the slit is positioned on one side of the slot. Aligned with the slit on the other side of slot is a light pulse detector means comprising a plurality of photocells. A housing capable of substantially excluding light contains the document receiving slot, the light source and photocell detector.

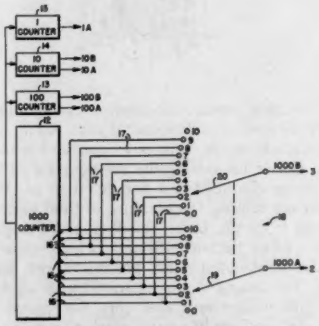
3,582,618
PAPER CURRENCY COUNTING APPARATUS
Charles T. Bergman, Watertown, and James H. Tanner, Milwaukee, both of, Wis., assignors to Brandt Automatic Cashier Co., Watertown, Wis.
Filed Jan. 23, 1968, Ser. No. 699,831
Int. Cl. G06m *7/06, 9/00*
U.S. Cl. 235—92 **14 Claims**

A currency counting machine is shown in which bills are fed singly from a stack in a receiving compartment through a counting compartment to a delivery compartment. The counting compartment includes a grounded runway over which bills are conveyed and spaced electrically conductive flexible brushes are mounted on the underside of a removable cover spaced above the runway. The brushes normally contact the runway but the contact is broken by bills passing between the brushes and runway. The passage of bills as sensed by the brushes operate in an electrical control circuit to prevent the flow of bills from the receiving compartment to the counting compartment if bills are not continuously fed, to eject from the counting compartment bills which are improperly spaced, and to register the count of properly spaced



bills in counters and a settable predetermined count mechanism.

3,582,619
DIGITAL CUTOFF
Robert F. Orr, and William C. Susor, both of Toledo, Ohio, assignors to The Reliance Electric and Engineering Company, Toledo, Ohio
Filed Dec. 16, 1968, Ser. No. 783,831
Int. Cl. H03k *21/36*
U.S. Cl. 235—92 **4 Claims**



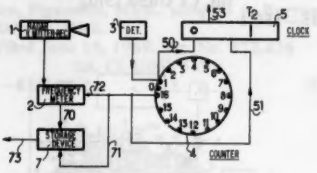
A digital cutoff system comprising a weighing scale, means for producing digital signals in accordance with load upon the scale, means for selecting a desired weight, and coincidence means for detecting coincidence between the digital signals and the desired weight and for detecting in at least one number place an additional digital signal greater than the desired digital signal in the number place. The additional digital signal forces the coincidence means to produce a cutoff signal even though the digital signals are greater than the desired weight.

3,582,620

METHOD AND APPARATUS FOR MEASURING THE CONCENTRATION OF AUTOMOTIVE TRAFFIC

Philippe Noetinger, Issy les Moulineaux, France, assignor to Compagnie Generale D'Automatisme, Paris, France

Filed Feb. 9, 1967, Ser. No. 614,885
Claims priority, application France, Feb. 9, 1966, 49,040
Int. Cl. C06f *15/48*
U.S. Cl. 235—150.24 28 Claims



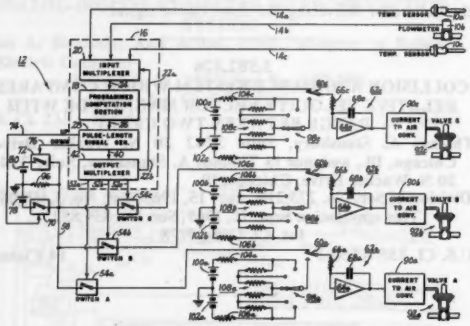
Device for the control of a signaling system for automotive traffic including a plurality of spaced local vehicle detecting devices providing indication of passage of each vehicle and speed thereof, a counter for counting the number of vehicles which pass each detecting device and a clock for indicating the time for passage of a given number of vehicles, the time from the clock and speed indication from the detecting device being compared with known parameters in a comparator to provide a control signal indicative of traffic conditions.

3,582,621

INDUSTRIAL PROCESS CONTROL APPARATUS

Richard P. Lawler, Mansfield, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Continuation of application Ser. No. 430,994, Feb. 8, 1965, now abandoned. This application May 20, 1968, Ser. No. 732,008
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.1 29 Claims



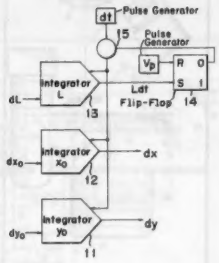
A computer-operated process control system wherein a high-speed digital computer receives a plurality of condition measurement signals such as pressure, temperature or the like, and produces a corresponding series of command signals for controlling respective process valves to positions providing stable operation of the process. The command signals in the disclosed embodiment are in the form of pulse-duration signals which are directed to electronic circuits each arranged to produce a continuous DC signal representing the desired position of a corresponding valve. The DC signal level is determined by the charge on a capacitor connected in the feedback circuit of an operational amplifier, and the command signal is operative to adjust the capacitor charge as required by the computer computations. Each capacitor with its associated amplifier serves as a memory device to maintain the valve signal at a set level while the computer is occupied in performing the remainder of the program cycle for the other process conditions.

3,582,622

INTERPOLATER FOR NUMERICAL CONTROL SYSTEMS

Nobuo Okuda, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Feb. 26, 1968, Ser. No. 708,413
Claims priority, application Japan, Feb. 28, 1967, 42/12438
Int. Cl. G06f *15/46*; G05b *19/18*
U.S. Cl. 235—151.11 7 Claims



Time pulses to be applied to a digital differential analyzer are intermittently eliminated by a gate circuit controlled by a reset input of a flip-flop circuit. The reset terminal of the flip-flop circuit receives speed control pulses corresponding to a predetermined machining speed and the set terminal thereof receives an output from an integrator having a register with contents in accordance with a machining distance of a machine tool. As an integral output corresponding to said register contents is obtained from the integrator, the clock pulses can be intermittently eliminated in a manner inversely proportional to the machining distance, thus providing a constant machining speed.

3,582,623

DETECTION OF MIXTURES OF NARROW BAND PHOTOLUMINESCERS

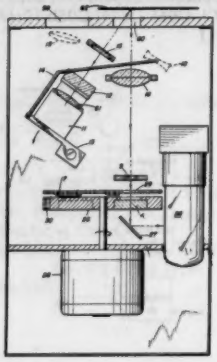
John L. Rothery, Marblehead, and Walter John Greene, Reading, both of, Mass., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 10, 1969, Ser. No. 790,270
Int. Cl. G06k *7/12*; G01n *21/30*, *21/38*
U.S. Cl. 235—61.11E 10 Claims

Readout process and apparatus for reading coded symbols in a code in which the components are narrow band photoluminescent compositions. The symbols, on suitable substrates such as paper tape, labels on cans, bottles and the like, are illuminated by flashes from a xenon tube with an ultraviolet transmitting filter. The flashing tube is aimable so that it can be directed either on a window in front of which tape containing the symbols is passed or through another window onto containers with labels and the like. Suitable optics are moved into position so that the different locations of the substrate do not change the image path length. When the symbols are illuminated with successive ultraviolet flashes, they luminesce in the visible in the different narrow band colors corresponding to the different components and this is imaged on a filter wheel having the same number of filters as there are components: four for numerical work or six for alphanumeric work. After passing through the filter wheel, the visible beam is imaged on the cathode of a photomultiplier tube. The filter wheel also is provided with magnets which open switches connecting the photomultiplier tube to different circuits for each filter and also generate a trigger pulse which

triggers the flashes of the xenon tube in synchronism with the positioning of each filter by the rotation of the wheel.

The signal from the photomultiplier tube passes through amplifiers, one for each filter, and into logic circuits which provide for gates to select the particular signal from a particular filtered beam and also start readout at the beginning of a symbol and reset after the filter wheel has made a second full revolution during which no signals are received. Response of each amplifier is delayed about 20 μsec. so that



the extremely short-persistence fluorescence from such compounds as optical brighteners and the like has died out and response is only from the slower decaying photoluminescence of the narrow band code components.

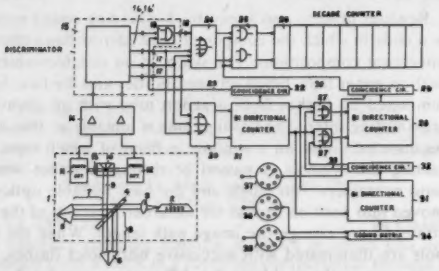
The logic circuits send out coded signals corresponding to the code to display mechanisms, such as Nixie tubes, or a permanent recording, such as a solenoid driven typewriter of the computer readout type, or both, or to a solenoid driven diverter for deflection from a conveyor system.

3,582,624

METHOD OF AND APPARATUS FOR APPROXIMATELY PROPORTIONAL REDUCTION OF IMPULSE SERIES

Friedrich Glantschnig, and Marcel Leroux, both of, Neuenhof, Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Feb. 14, 1968, Ser. No. 705,334
Int. Cl. H03k *21/00*
U.S. Cl. 235—92 **5 Claims**



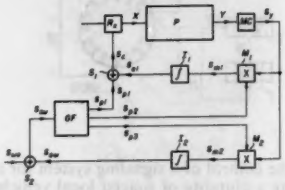
A method of and apparatus for producing an output pulse sequence having a pulse number which is approximately proportional to the pulse number of an input pulse sequence. The device is utilized for digital determination of a measured length determined in a laser interferometer in standard decimal units, the input pulse sequence being derived from the laser light signal interferometrically modulated upon variation of the measured length.

3,582,625

CONTROL METHOD AND APPARATUS FOR EXTREMALIZING THE VALUE OF A FINAL CONTROLLED VARIABLE OF AN INSTALLATION

Roland Rouxel, Seyssinet, and Jean-Luc Melennec, Grenoble, both of, France, assignors to The Battelle Development Corporation, Columbus, Ohio

Filed June 3, 1968, Ser. No. 734,10[illegible]
Claims priority, application Switzerland, Jun[illegible], 1967, 7868/67
Int. Cl. G05b *13/02*
U.S. Cl. 235—150.1 **4 Claims**



The invention provides an improvement to an usual method of optimalizing the control of an industrial installation by periodically and continuously disturbing a regulating variable governing the operation of the installation. To avoid the drawbacks due to the inherent phase-shift of the installation, the improvement consists in modifying the periodic disturbance in dependence on the instantaneous value of the final controlled variable by multiplying the pilot signal used in the usual control method by a periodic signal having the same shape and frequency as that used in this usual control method, but which is in quadrature therewith, by producing an adapting signal equal to the integral of the result of this multiplication, by adding this adapting signal to a reference signal and by causing the frequency of the periodic disturbance to vary proportionately with the signal resulting from this addition.

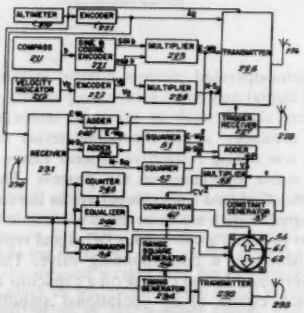
The apparatus for carrying out this improved method comprises, in addition to the usual circuits, a multiplier, an integrator and an adder connected in succession, the output of the adder being connected to the frequency control input of the generator delivering the disturbance signal.

3,582,626

COLLISION AVOIDANCE SYSTEM WHICH COMPARES RELATIVE VELOCITY VECTOR MAGNITUDE WITH RANGE BETWEEN TWO CRAFT

Thomas A. Stansbury, Suite 3242 20 N. Wacker Drive, Chicago, Ill., assignor to Thomas A. Stansbury, Suite 3242 20 N. Wacker Drive, Chicago, Ill.

Division of Ser. No. 273,219, Apr. 15, 1963, Pat. No. 3,469,069. This application Sept. 22, 1969, Ser. No. 859,852
Int. Cl. G06g *7/78*
U.S. Cl. 235—150.2 **14 Claims**



A collision avoidance system utilizes only the parameters of course, velocity and range for surface craft and only the

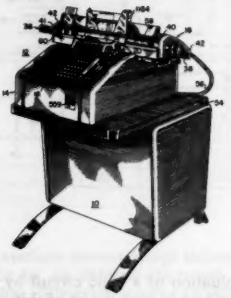
parameters of course, velocity, range, and altitude for aircraft. Time to collision is considered equal to the time to the point of nearest approach when the range between two craft falls below a predetermined value. Range to the point of closest approach is not required to determine that a collision hazard exists. No directional antennae are utilized.

3,582,627

AUTOMATIC ACCOUNTING MACHINE

Roy L. Phelan, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 16, 1969, Ser. No. 872,436
Int. Cl. G06k *5/00*
U.S. Cl. 235—61.7 **32 Claims**



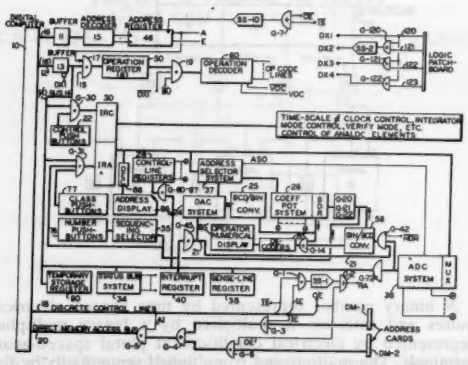
An accounting machine has a pair of transducing heads for writing and sensing information and its complement on and from a pair of magnetic tracks on a record member as the record is moved in and out of the machine past the heads. Coincidence and nonequivalence error checking circuits are also responsive to the information sensed from the tracks to halt the operation of the machine when an error in the sensed information is detected.

3,582,628

ANALOG-DIGITAL COMPUTER INTERCONNECTION SYSTEM

John A. Brussolo, Ann Arbor, Mich., assignor to Reliance Electric Company

Filed July 31, 1967, Ser. No. 657,290
Int. Cl. G06j *3/00*
U.S. Cl. 235—150.5 **22 Claims**



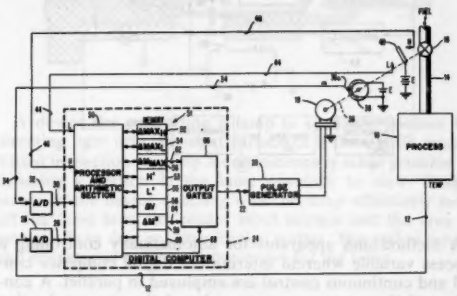
A hybrid analog-digital computer including a plurality of analog computer elements for interconnection with a digital computer in which the digital computer input-output bus is connected to write operation code signals in a first register using a first address and to write control and address instructions in a second register into which control and address instructions also may be entered manually, and in which the digital computer uses a second output address to execute the operation stored in the first register, to control and address analog computer elements in accordance with the contents of the second register and to transfer data between the hybrid analog-digital computer and the digital computer.

3,582,629

DIGITAL PROCESS CONTROL METHOD AVOIDING WINDUP

Charles W. Ross, Hatboro, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed Aug. 14, 1968, Ser. No. 752,609
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.1 **5 Claims**



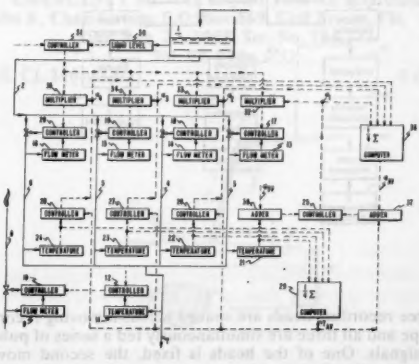
A method for determining the control signal to be produced by a digital control system by first determining the output desired, determining the maximum possible output allowed by the constraints on the system, comparing them and outputting the desired value if it does not exceed the maximum possible value. Otherwise, that part of the control signal computed from stored values indicative of past control actions which are not effective is determined and that value is then added to the desired output determined for a subsequent control interval to obtain a corrected desired output and prevent windup.

3,582,630

PROCESS AND APPARATUS FOR CONTROLLING A FURNACE

Jan E. Koetsier, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed May 19, 1969, Ser. No. 825,681
Claims priority, application Great Britain, July 9, 1968, 32614/68
Int. Cl. G05 *13/02*; **F28f** *27/02*
U.S. Cl. 235—151.1 **6 Claims**



A control system for a furnace having at least two parallel heating coils wherein the average exit temperature of all the

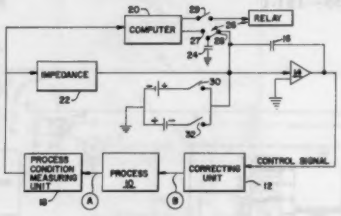
coils is computed and used to control the flows to the individual coils whereby the exit temperature of each coil approaches the average.

3,582,631

CONTROL OF A PROCESS VARIABLE BY MEANS OF COMPUTER

Johannes E. Rijnsdorp, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed May 23, 1969, Ser. No. 827,192
Int. Cl. G05b *13/02*
U.S. Cl. 235—151.1 **5 Claims**



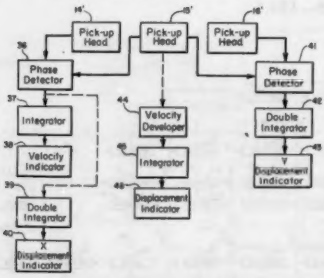
A method and apparatus for automatically controlling a process variable wherein intermittent digital computer control and continuous control are employed in parallel. A condition of the process is measured and the measured value supplied to a computer which on the basis of this value calculates a desired setting of a correcting unit and intermittently produces a signal representing the calculated condition. The controlling signal is the output of an operational amplifier fed back by means of a capacitance. The controlling signal is changed by electrical charge added or subtracted from the capacitor. The change may be caused intermittently by the computer. But, also a continuous electrical signal corresponding to the measured value of the process variable is supplied to the input of the operational amplifier via an impedance which behaves like a capacitor at least with respect to direct current.

3,582,632

ACCELERATION RECORD READER

Leigh Curtis Eoster, Atherton, Calif., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 617,673, Feb. 21, 1967, Pat. No. 3,394,381.
Int. Cl. G01p *3/66;* **G01c** *21/10*
U.S. Cl. 235—151.32 **3 Claims**



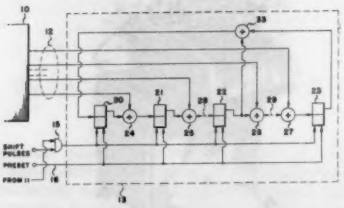
Three recording heads are spaced across a moving recording tape and all three are simultaneously fed a series of pulse-type signals. One of the heads is fixed, the second moves relative to the first in response to acceleration in an *x*-direction and the third moves similarly but in response to acceleration in a *Y*-direction. The apparatus is mounted in a vehicle, the tape thus storing information pertaining to its accelerations in coordinate directions and similarly with respect to the magnitude of its velocity. Readout apparatus used subsequently includes circuits to integrate the stored information and yield indications of velocity and displacement. Those indications permit the route taken by the vehicle to be plotted.

3,582,633

METHOD AND APPARATUS FOR FAULT DETECTION IN A LOGIC CIRCUIT

Robert E. Webb, Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Feb. 20, 1968, Ser. No. 706,852
Int. Cl. G05b *1/01;* **G06f** *11/04;* **G08b** *23/00*
U.S. Cl. 235—153 **8 Claims**



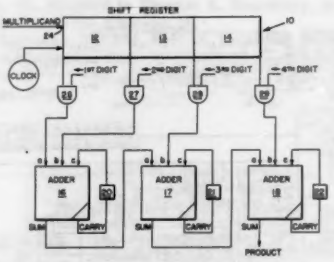
Performs an evaluation of a logic circuit by establishing a type of shift register having a sequence of shifting determined by the logic signals present at outputs of the circuit being evaluated. If the register is preset to a certain number and shifted at the consistent control of the outputs of a properly functioning circuit, the number remaining in the register at the end of the operating cycle is always the same, whatever that number may be. Inconsistent control of the shifting caused by the different logic output signals of a malfunctioning circuit produces a different number remaining in the register, indicating that the circuit has not functioned properly.

3,582,634

ELECTRICAL CIRCUIT FOR MULTIPLYING SERIAL BINARY NUMBERS BY A PARALLEL NUMBER

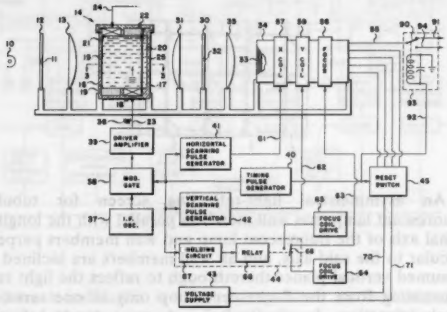
William F. Bartlett, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Oct. 15, 1968, Ser. No. 776,051
Int. Cl. G06f *7/39*
U.S. Cl. 235—164 **1 Claim**



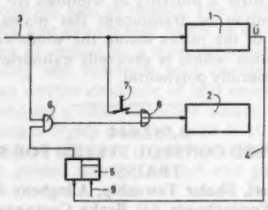
A binary number represented by time spaced electrical pulses and intervals is multiplied by a binary multiplier represented by electrical conditions at plural spaced-apart terminals. The multiplicand is multiplied sequentially by the successive digits of the multiplier to produce partial products. The partial products are applied to binary adders and cumulatively added to produce a final product. The multiplications are done by selectively inhibiting and partially enabling gates at the inputs to the adders in accordance with the digits of the multiplier. The multiplicand signals are applied through a shift register to the gates in sequence. The adders are arranged for serial addition and in cascade.

3,582,635
OPTICAL CORRELATION OF ELECTRONIC PULSES
Leo Slobodin, Holmdel, N.J., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Apr. 16, 1968, Ser. No. 721,660
Int. Cl. G06g 7/18; H03k 19/14
U.S. Cl. 235—181 18 Claims



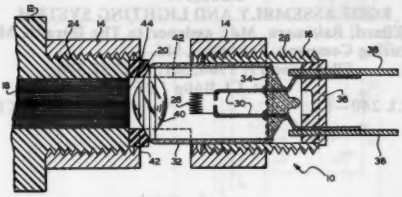
A moving waveform density image induced in an ultrasonic light modulator by an applied electronic pulse is optically correlated with a diffraction grating formed by grooves in a transparent plate inserted in the modulator. A collimated light beam passing through the modulator transversely of both the moving waveform density image and grooved plate is optically diffracted and the diffracted light is focused by a lens upon a slit preceding a photodetector in such a manner that only a lower order of the diffracted light passes through the slit. The photodetector responds to changes in light intensity resulting from phase correlation of the density image and the grooves in the plate to provide an electrical output signal representing the correlation function. Pulses of carrier wave energy which are narrow relative to the full optical aperture of the correlator are expanded and pulses which are long relative to the full optical aperture are compressed by the device.

3,582,636
CIRCUIT ARRANGEMENT FOR CALCULATING A CHECK DIGIT
Uwe Bertram, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 24, 1968, Ser. No. 786,585
Int. Cl. G06f 11/10; G08c 25/00
U.S. Cl. 235—153 6 Claims



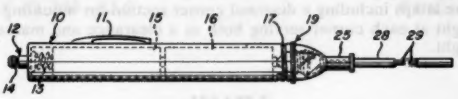
A circuit for calculating and employing a check digit, having two module M counters, the first counter coupled directly to a weighted series of pulses, the second counter responsive to a carry from the first counter for counting double the number of input pulses applied to the first counter, completion of the series providing the M complement of the check digit in said second counter, and providing the check digit to the circuit resulting in nonzero condition in the second counter of the digit sequence is in error.

3,582,637
MOUNTING ARRANGEMENT FOR A FIBER OPTIC READER AND LAMP ASSEMBLY
John Cecil, Jr., Skaneateles, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed Jan. 29, 1969, Ser. No. 795,008
Int. Cl. G02b 5/14
U.S. Cl. 240—1EL 2 Claims



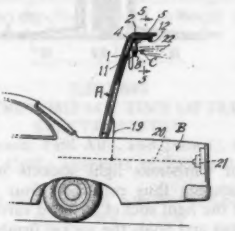
A device for supporting a lamp in optimum position for directing light into the input surface of a fiber optic reader. Visual inspection for lamp incandescence is made possible by exposing a portion of the lamp envelope to view. Gasket means in the device coacting with the lamp effectively seals off the lamp lens, the reader input surface and the area in between from dust or other foreign matter. The gasket means also operates as a vibration dampener for the lamp.

3,582,638
SPOT LIGHTING DEVICE
Maurice E. Peters, Xenia, Ohio, assignor to Kurz-Kasch, Inc., Dayton, Ohio
Filed Apr. 22, 1968, Ser. No. 722,894
Int. Cl. F21v 33/00
U.S. Cl. 240—6.46 10 Claims



A light projecting device featuring a unique adapter enabling the ready mount of a flexible light guide to a pocket flashlight or other light source whereby to provide a simple but highly effective means for directing emitted light to a remote difficult to illuminate spot. The adapter includes a tubular light channelling device held relatively to an illuminable lamp and providing a bearing for the flexible light guide.

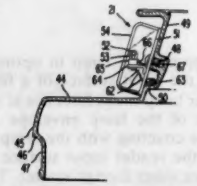
3,582,639
EMERGENCY SIGNAL LIGHT FOR AUTOMOBILE
John R. Chamberlain, P.O. Box 569, Gulf Breeze, Fla.
Filed Aug. 23, 1968, Ser. No. 754,772
Int. Cl. B60q 1/52
U.S. Cl. 240—7.1 3 Claims



A casing containing a signal lamp is secured in a mounting plate which is hinged at one edge to a support bar mounted

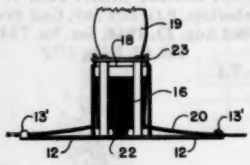
on a structure such as the inner wall of an automobile trunk lid. Means including parts on another edge of said plate and on said structure, respectively, selectively releasably holds the plate in an out-of-the-way position against the structure and permits the plate to swing by gravity about its hinged edge away from said structure into operative position to project light rays.

3,582,640
ROOF ASSEMBLY AND LIGHTING SYSTEM
Jack Ellard, Baltimore, Md., assignor to The Duralite Manufacturing Company, Baltimore, Md.
Filed June 17, 1968, Ser. No. 737,398
Int. Cl. B60g *1/26*
U.S. Cl. 240—8.2 **9 Claims**



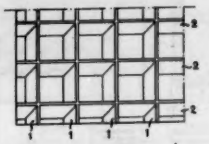
A simplified system of clearance, marker and identification lights for a road vehicle in which the number of individual lights necessary to comply with regulations is reduced and the lights are positioned for better effect and installed from the exterior without perforations through the body of the vehicle by the use of a sloped wall roof rail having a cable supporting groove and a self-tapping screw slot for mounting the lamps including a diagonal corner section for mounting a light at each corner serving both as a clearance and marker light.

3,582,641
DECORATIVE LIGHT HOLDERS
Ronald M. Choquette, Box 100, Wawota, Saskatchewan, Canada
Filed Aug. 23, 1968, Ser. No. 754,940
Int. Cl. A44b *21/00*
U.S. Cl. 240—10 **3 Claims**



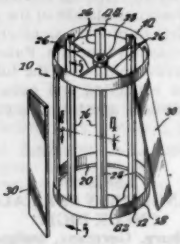
A holder for Christmas light sockets is made from a pressing or stamping thus providing four upstanding legs which embrace the light socket. A band surrounds the upper ends of these legs and holds the socket firmly in position and the two remaining legs of the stamping can be utilized to engage the wire feeding the sockets or can have a wrap around device substituted therefor which engages the branch of a tree or the like.

3,582,642
ASYMMETRICAL LIGHT-REFLECTING SCREENS
Sune Johansson, Varnamo, Sweden, assignor to Elektriska Aktiebolaget Exaktor, Varnamo, Sweden
Filed Mar. 15, 1968, Ser. No. 713,471
Claims priority, application Sweden, Mar. 29, 1967, 4246/67
Int. Cl. F21s *1/06*
U.S. Cl. 240—78 **6 Claims**



An asymmetrical light-reflecting screen for tubular fluorescent lamps has wall members parallel with the longitudinal axis of the fluorescent lamp and wall members perpendicular to the said axis, and all wall members are inclined to assumed vertical planes therethrough to reflect the light rays emanating from the fluorescent lamp only in one sense in each direction longitudinally and transversely of the fluorescent lamp.

3,582,643
LAMP SHADE CONSTRUCTION
Frank L. Heise, 1835 Tanglewood Drive, Glenview, Ill.
Filed Mar. 10, 1969, Ser. No. 805,527
Int. Cl. F21v *1/04*
U.S. Cl. 240—108 **5 Claims**

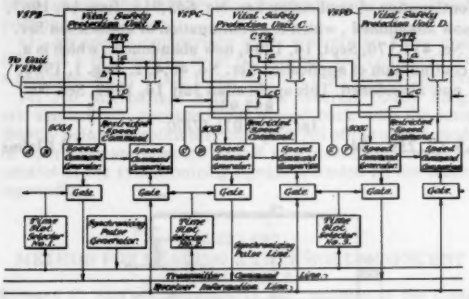


A lamp shade formed of a frame or cage having upper and lower cage rings. The rings are joined by a plurality of generally V-shaped fixture members which cooperate with one another to form a plurality of windows for receipt and removable retention of translucent flat plates or panels. Upon assembly of the plates within the windows, the shade has a configuration which is generally cylindrical as distinguished from generally polyhedral.

3,582,644
FAIL-SAFE SPEED CONTROL SYSTEM FOR RAILROAD TRAINS
Philip R. Schatzel, Shaler Township, Allegheny County, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed Oct. 2, 1968, Ser. No. 764,524
Int. Cl. B61l *23/20*
U.S. Cl. 246—34CT **4 Claims**

An improved fail-safe speed control system for railroad trains in which the traffic conditions which establish the permissible speed for a train are determined at a central station in accordance with track occupancy indications transmitted from wayside locations. These indications and return speed command signals are carried over a communication system linking the central station and all wayside locations. To eliminate possible incorrect delivery of proceed speed com-

mands due to communication system faults, restricted speed commands are delivered to wayside locations over direct connections from the central station completed in response to occupied track indications. For additional safety, an occupied track indication is cleared only when an indication is recorded that the corresponding train has moved into the advance track section.

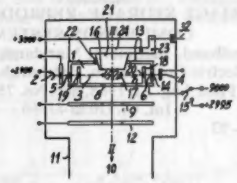


3,582,645

COMBINED FIELD AND IMPACT IONIZATION SOURCE FOR MASS SPECTROMETERS

Curt Brunnee, and Kurt Elfenbein, both of Bremen, Germany, assignors to Varian Mat G.m.b. H., Bremen, Germany

Filed Nov. 7, 1967, Ser. No. 681,256
Claims priority, application Germany, Nov. 19, 1966, B89894
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 **7 Claims**



A combined field and impact ionization source includes a conducting housing embracing the trajectory of an electron beam for producing ions by impact. The conducting housing includes an ion exit gap through which an electric field leads ions produced by impact to a mass spectrometer. The conducting housing also functions as a counterelectrode that coacts with an emitter electrode of very small radius of curvature to comprise a field ionization source when the conducting housing is highly negative, such as 10 kilovolts, relative to the emitter electrode to produce ions by field ionization that are guided through the ion exit gap to the mass spectrometer.

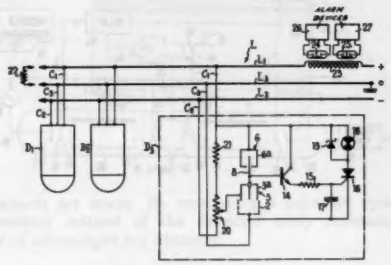
3,582,646

IONIZATION FIRE DETECTION DEVICE

Christian Marie Maurice Bertrand Ponsar, Paris, France, assignor to Vigifeu, Aubervilliers, France

Filed Feb. 6, 1968, Ser. No. 703,348
Claims priority, application France, Feb. 9, 1967, 94-266
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 **15 Claims**

A fire detection device comprising an enclosure enclosing a reference ionization chamber and an unsaturated measuring ionization chamber interconnected in series and each containing a source of radioactive radiations, at least one alarm and/or automatic intervention device, a grid permeable to gases defining one end of the enclosure, the enclosure having apertures communicating with passages at one end of the unsaturated chamber so that gas can flow through the unsaturated chamber, from outside the device, a common electrode extending into both chambers and a printed circuit controlling the alarm and/or intervention device.

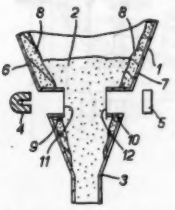


3,582,647

APPARATUS FOR DETERMINING THE DENSITY OF PULVERALENT MATERIALS IN A RESERVOIR BY MEANS OF A RADIOACTIVE SOURCE AND DETECTOR

Maurice G. Figuet, Vieux Thann; Gerard Rottner, Thann, and Andre Louis Michaud, Vieux Thann, all of, France, assignors to Fabriques de Produits Chimiques de Thann et de Mulhouse, Thann, France

Filed Aug. 27, 1969, Ser. No. 859,492
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 **7 Claims**



Apparatus and process for checking the flow of pulverulent materials contained in a reservoir, which consists of measuring the absorption of an electromagnetic radiation of suitable frequency by the mass of material situated in the reservoir at the level of measurement.

3,582,648

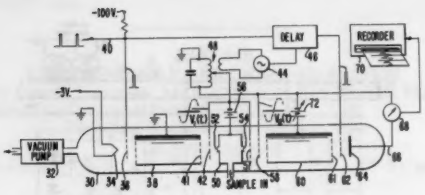
ELECTRON IMPACT TIME OF FLIGHT SPECTROMETER

Weston A. Anderson, Palo Alto, and John C. Helmer, Menlo Park, both of, Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed June 5, 1968, Ser. No. 734,690
Int. Cl. H01j *37/00*
U.S. Cl. 250—49.5 **10 Claims**

An electron impact time of flight spectrometer including means providing monochromatic electrons of a predetermined kinetic energy which are caused to impinge upon a sample material so that some of the electrons experience an

energy transition in passing through the material. The electrons are then differentially accelerated such that electrons



having similar energy levels will be caused to converge and arrive at a detector in tightly formed bunches.

3,582,649

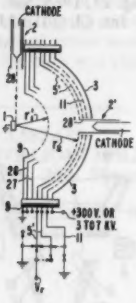
RETARDING FIELD ELECTRON DIFFRACTION SPECTROMETER HAVING IMPROVED RESOLUTION

Norman J. Taylor, Los Altos, assignor to Varian Associates, Palo Alto, both of, Calif.

Filed Oct. 21, 1968, Ser. No. 769,350

Int. Cl. H01j *37/26*

U.S. Cl. 250—49.5 **4 Claims**



A retarded field electron diffraction spectrometer is disclosed which includes an electron gun for directing substantially monoenergetic electrons onto the surface to be examined of a target to produce scattered electrons from such surface. A spherical retarding grid structure is concentrically disposed of the target in the space between the target electrode and a concentric spherical fluorescent screen. A retarding potential applied to the retarding grid permits only those target scattered electrons having a potential greater than the potential of the retarding electrode to reach the fluorescent screen. The retarding grid electrode has grid openings defining electron passageways having a characteristic diameter less than three times the characteristic length thereof to improve the uniformity of the retarding field. A spherical shield grid electrode is concentrically disposed of and has a radius within the range of 0.3 to 0.8 of that of the retarding grid to enhance the resolution of the spectrometer.

3,582,650

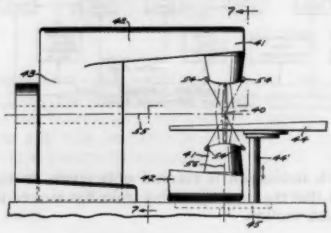
SUPPORT STRUCTURE FOR ELECTRON ACCELERATOR WITH DEFLECTING MEANS AND TARGET AND COOPERATING PATIENT SUPPORT

Robert F. Avery, Moraga, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of application Ser. No. 645,916, June 14, 1967, now abandoned , which is a continuation of application Ser. No. 411,170, Sept. 14, 1964, now abandoned , which is a continuation of application Ser. No. 46,432, Aug. 1, 1960, now abandoned. This application July 14, 1969, Ser. No. 852,958

Int. Cl. H01j *37/00*

U.S. Cl. 250—54 **3 Claims**



Improved linear accelerator apparatus for directing ionizing radiation on an object is realized by utilization of a horizontal axis of rotation about which the linear accelerator axis rotates while the accelerator axis maintains a horizontal spatial orientation at different circumferential points of rotation in conjunction with beam deflection means disposed at the downstream end portion of the accelerator which produce beam deflection along an axis different than the accelerator axis and preferably substantially 90° with respect thereto.

3,582,651

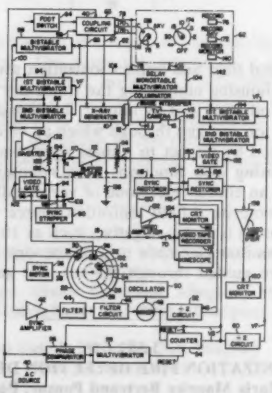
X-RAY IMAGE STORAGE, REPRODUCTION AND COMPARISON SYSTEM

Melvin P. Siedband, Baltimore, Maryland, assignor to Westinghouse Electric Corporation, Pittsburgh, Pennsylvania

Filed Aug. 22, 1968, Ser. No. 754,546

Int. Cl. G03b *41/16*

U.S. Cl. 250—93 **13 Claims**



An image storage and display system is disclosed primarily intended to be used with X-ray apparatus. An X-ray image is scanned by a television recorder and recorded on a continuous loop recording media such as a magnetic disk. Synchronizing signals are pre-recorded on the recording media and are utilized for controlling the scanning operation of the television camera. The system may be operated

in a plurality of modes including:

(1) A stop action mode wherein a frame of the X-ray image is recorded and then may be continuously played back.

(2) An image enhancement mode wherein a previosuly recorded image is compared with a real time image presently being scanned by the television camera to enhance particular portions of the image.

(3) An energy comparison mode wherein an X-ray image taken at a first energy level is recorded and compared with a real time X-ray image being taken at a second energy level.

(4) An intermittent slide mode wherein X-ray images are sequentially recorded and played back with the image display being intermittently changed. All of the above modes of operation are effected in full synchronization under the control of the synchronizing signals recorded on the recording media.

3,582,652

METHOD FOR READING A THERMOLUMINESCENT DOSIMETER

Richard C. McCall, Woodside, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 12, 1970, Ser. No. 2,346

Int. Cl. G01t *1/11*

U.S. Cl. 250—71R **8 Claims**

A method for reading the exposure of radiation sensitive thermoluminescent material to X-radiation or radiation from a radioactive source, comprising the steps of very rapidly heating the material to a temperature slightly above the temperature of peak luminescence, evenly maintaining the material at the attained temperature for a period that extends at least to the termination of luminescence of the material, and sensing the total luminescence of the material.

The invention disclosed herein was made under, or in the course of Contract No. AT(04–3)–400 with the UNITED STATES ATOMIC ENERGY COMMISSION.

3,582,653

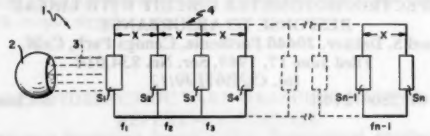
IONIZING RADIATION SPECTROMETER

Robert G. Howard, 306 Washington St., Annapolis, Md.

Filed June 16, 1970, Ser. No. 046,673

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5R **17 Claims**



Quantitative measuring devices such as capsules of lithium flouride are placed within a stack of filter plates and one end of the stack is directly exposed to a beam of radiation. The quantitative measuring devices are then removed from the filtering materials stack and treated to yield a discernible and measurable entity proportional to the amount of energy absorbed from the radiation. The energy spectrum is then mathematically solved to produce the percentage of the total energy of the radiation residing in each band of a number of discrete energy bands. The number of bands are equal to the number of quantitative measuring devices used and the bands maybe of equal or unequal bandwidth.

3,582,654

RADIATION DETECTOR UTILIZING LATERAL PHOTOVALTAIC EFFECT WITH EPITAXIAL RESISTANCE LAYER

Johannes Meuleman, Rame-Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

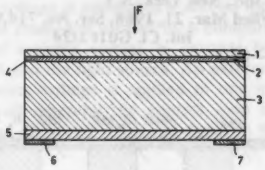
Filed Oct. 2, 1968, Ser. No. 764,572

Claims priority, application France, Oct. 9, 1967, 123745

Int. Cl. G01e *1/29*; H01l *15/00*

U.S. Cl. 250—83 **6 Claims**

A radiation detector utilizing the lateral photovoltaic effect to establish the point of impact of incident radiation is described. On the back of the monocrystalline semiconductor is provided an epitaxial layer of lower resistance to which



two contacts are made. By employing a separate epitaxial layer resistor instead of the detector body resistance, a number of advantages are obtained.

3,582,655

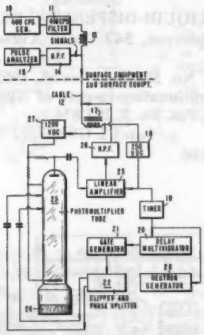
GATED SPECTRAL WELL LOGGING RADIATION DETECTION SYSTEM

Wilmer A. Hoyer; Robert C. Rumble; Donald H. Britton, deceased, late of Houston, Tex.; Donald H. Britton, all of Houston, Tex.; John D. Ball, deceased, Late of Lubbock, Tex., and Verna D. Ball, executrix, of said John D. Ball, deceased, assignors to Esso Production Research Company

Filed Oct. 14, 1966, Ser. No. 587,943

Int. Cl. G01t *1/20*; G01v *5/00*

U.S. Cl. 250—83.3 **3 Claims**



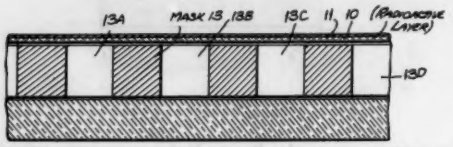
A gated spectral radiation detector system which operates with sharp turn-on rise and turnoff decay times, high signal-to-noise ratio, good linearity and temperature stability. The system is capable of use in well logging operations. Detected radiation is converted to electrical pulses or signals proportional to the energies of the detected radiation. These signals are amplified and transmitted to the surface where they are processed and recorded. Components of the system include a surface AC power source and subsurface means for changing the AC power to DC; a radiation detector for detecting and converting radiation energies to electrical signals; an amplifier powered by DC and preferably including feedback circuits to reduce distortion of the electrical signals and produce a desired amplifier output impedance; timer means powered by DC to produce a positive pulse which is shaped and split to produce two pulses having amplitudes which produce minimum distortion and high on-off ratio of the radiation detector; and other means to change the AC power source to DC power to operate the detector. A variation in the detector system provides for two gated detectors capable of simultaneous detection of radiation which originates at the same or different times or simultaneous detection of gamma radiation originating at a particular time and sensing of the magnitude of neutron flux at any predetermined time.

3,582,656

TIME BASE COMBINING RADIOACTIVE SOURCE AND SOLID-STATE DETECTOR

Dale R. Koehler, River Vale, N.J., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed Mar. 21, 1968, Ser. No. 714,954
Int. Cl. G01t 1/24
U.S. Cl. 250—83.3 **11 Claims**



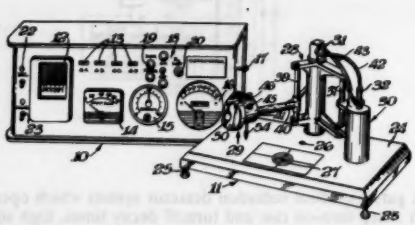
A radioactive timekeeping standard constituted by a radioactive source of alpha particles combined with a solid-state radiation detector, the source being in the form of a backing having a planar array of discrete islands of a radioactive isotope, the alpha particles emitted therefrom passing through an apertured mask and impinging on the sensitive surface of a solid-state radiation detector, the geometry of the mask apertures, which are in a matching array, being such as to restrict emanations impinging on the detector surface to substantially normal angles of incidence and in addition preventing particles emanating from any one island from impinging on a neighboring portion of the detector surface associated with another island.

3,582,657

LIQUID-DISPENSING DEVICE

John Lynde Anderson, 542 Union Avenue, New Providence, N.J.

Division of Ser. No. 506,566, Nov. 5, 1965. Pat. No. 3,412,247 which is a continuation-in-part of Appl. Ser. No. 161,246, Dec. 21, 1961, Pat. No. 3,297,874.
Int. Cl. G01t 7/02
U.S. Cl. 250—106 **9 Claims**



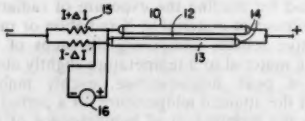
In studying surfaces a volatile material is applied to the surface and its rate of evaporation therefrom is followed, the values obtained being compared to the rate of evaporation from control surfaces. By this approach one can study the amount of contamination on the surface being tested, the nature of the said surface and similar factors. Apparatus and compositions of matter for effecting such studies are described and claimed in Ser. No. 506,566, now U.S. Pat. No. 3,412,247. The present application and invention relates to certain pieces of apparatus used in such studies. Particularly, this invention relates to apparatus for dispensing the volatile materials that are applied in conjunction with a detection device used in following the rate of evaporation of the volatile materials. The dispenser is a device which contains a reservoir for the volatile material positioned in the device so that it can be placed in conduit relationship with an outlet for the said materials allowing for the placement for those materials on the surface to be tested. Contained in the dispenser are a charge pump and a discharge pump which can be placed in conduit relationship with said reservoir and with said outlet as desired to effect the removal of a metered amount of the volatile materials as desired. The detecting device comprises a means for following the rate of evaporation of the volatile materials and a means for passing a controlled flow of gas between the detecting device and the surface containing the volatile materials. Generally, the volatile materials contain a radioactive material and the means for detecting is a means for detecting radiation such as a Geiger-Mueller counter. The detecting device also generally contains a means for controlling the flow of gas, a means for filtering the gas to eliminate contaminants and a means for placing the detecting device into a desired position in relationship to the surface being tested.

3,582,658

LIGHT SCANNING DEVICE UTILIZING PIEZOELECTRIC SEMICONDUCTOR MATERIAL

Yoh Mita, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed July 15, 1969, Ser. No. 841,904
Int. Cl. H01j 39/14
U.S. Cl. 250—211 **3 Claims**



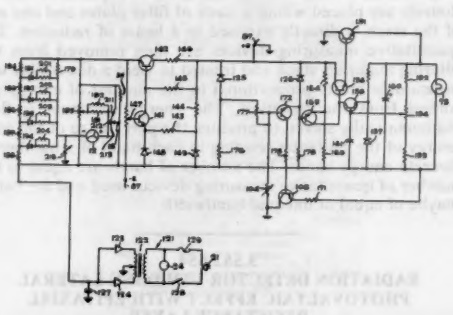
A solid-state light scanning device includes two rodlike crystal of piezoelectric semiconductor material disposed substantially parallel and offset with respect to one another, each provided with electrodes at the opposite ends, and a photoconductor sandwiched between the two crystals to form an integrated unit. Means are also provided to initiate electric fields in said crystals with a predetermined time difference.

3,582,659

SPECTROPHOTOMETER CIRCUIT WITH LINEAR RESPONSE TO ABSORBANCE

Manuel S. Dekker, 20440 Parthenia, Canoga Park, Calif.

Filed June 17, 1969, Ser. No. 834,014
Int. Cl. H01j 39/12
U.S. Cl. 250—214R **6 Claims**



This photometer employs a network of negatively biased diodes to compensate for the nonlinear characteristics of its solid-state photodetector and detector circuit, and thereby linearize its electrical response with respect to absorbance. The instrument features an integrated, fixed-geometry cuvette holder, light aperture, monochromatic filter, photodetector, and incubator block with continuous electronic tem-

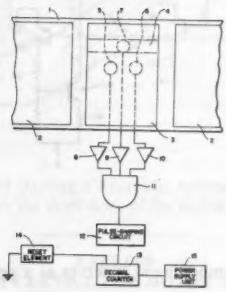
perature control capability. Calibration is accomplished by varying the light intensity by means of a highly stable, finely adjustable variable lamp power supply.

3,582,660

APPARATUS FOR SENSING IDENTIFYING MARKS PLACED UPON AN INFORMATION-BEARING MEDIUM

Heinz Muller-Sadla, Kirchberg, and Harry Riedel, Berkheim, both of, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1969, Ser. No. 794,208
Claims priority, application Germany, Apr. 5, 1968, P 17 72 151.6
Int. Cl. G08c 9/06
U.S. Cl. 250—219 5 Claims



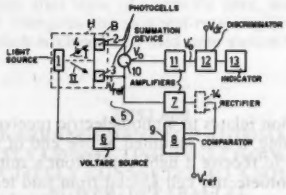
This disclosure relates to apparatus for sensing and counting code images or patterns disposed upon an information-bearing medium to identify the information carried by the medium. In an illustrative embodiment of this invention, the apparatus includes at least three suitable radiation-sensitive elements which are disposed to selectively sense the code images, suitable circuitry responsive to the signals derived from the radiation sensitive elements to provide an output signal in response to the scanning of a code image, and a suitable counting or summing device responsive to the circuitry to count and to provide a manifestation of the sum of such output signals.

3,582,661

PHOTOELECTRIC YARN MEASURER HAVING REFERENCE CHANNEL

Hermanus Stephanus Josephus Pijls, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporaton, New York, N.Y.

Filed Sept. 23, 1968, Ser. No. 761,431
Claims priority, application Netherlands, Sept. 15, 1967, 6713063
Int. Cl. G01n 21/30
U.S. Cl. 250—219 9 Claims



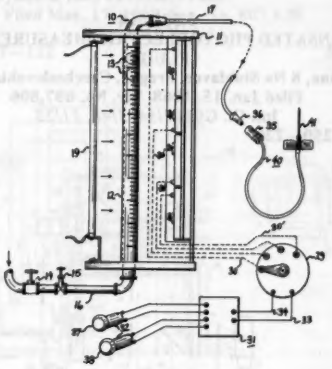
A yarn cleaner for measuring the absolute yarn diameter includes a light source optically coupled to first and second photocells arranged in a measuring channel through which the yarn passes and a reference channel without yarn, respectively. The respective yarn and reference signals from the first and second photocells are summed together to derive a signal proportional to the absolute yarn diameter. The latter signal is applied to one input of an amplitude discriminator and a threshold voltage is applied to a second input thereof. A control loop is formed by a comparison circuit and a source of variable voltage in cascade between the second photocell and the light source. An external source of adjustable reference voltage is applied to one input of the comparison circuit whereby the control loop operates to match the second photocell reference signal to the external reference voltage.

3,582,662

RADIATION SENSITIVE ELECTRONIC FLOW GAUGING SYSTEM

Emil Henry Soika, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 6, 1970, Ser. No. 25,768
Int. Cl. G01n 21/26
U.S. Cl. 250—222 6 Claims



A rotameter is adapted to relay a signal that indicates whether the opaque float ball of the rotameter is within some predetermined longitudinal segment of the transparent rotameter tube. A solar cell is mounted on one side of the tube and a light source mounted on the other side. The cell is mounted in a position to monitor and receive light emitted from the light source which has passed through that segment of the tube. The output of the cell is amplified and applied to a signal means. When the float ball is outside the monitored segment of the tube, the cell receives all the incident light from the light source. When the float ball enters the monitored segment, it casts its shadow on the cell, and so long as the ball remains in that segment, the output of the cell is reduced thereby reducing the amplified output which is noted by the signal means.

3,582,663

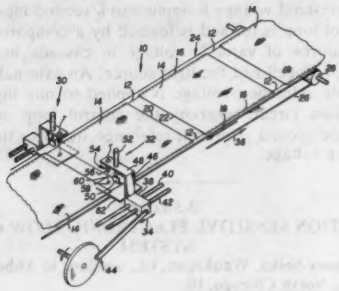
CHAIN THREAD SEVERER WITH LIGHT SOURCE AND PHOTOCELL HAVING RELATIVE RECIPROCAL MOVEMENT

Marinus Troast, Jr., Little Falls; Timothy Troast, Pompton Lakes, and Joseph C. Lamonica, Garfield, all of, N.J., assignors to I. C. Herman & Co., Inc., New York, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,707
Int. Cl. G06m 7/00
U.S. Cl. 250—223 4 Claims

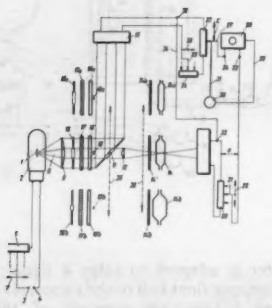
A device for cutting chain thread, such as results from a prior sewing operation, which interconnects the trailing and leading edges of handkerchiefs or the like. The cutting mechanism initially moves in the feed direction with the handkerchiefs, which movement effectively both enlarges the

opening between adjacent handkerchiefs and pulls the chain thread taut and then subsequently moves in a counterfeed



direction across the opening, during which time it effectively severs the taut chain thread.

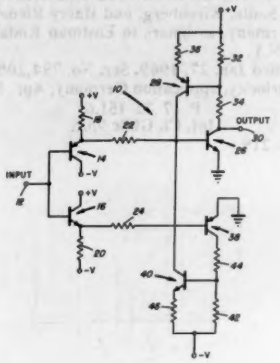
3,582,664
COMPENSATED PHOTOELECTRIC MEASUREMENT OF FLUIDS
Jiri Hrdina, 8 Na Stahlavce, Prague, Czechoslovakia
Filed Jan. 15, 1968, Ser. No. 697,806
Int. Cl. G01j *3/34, 3/48, 21/22*
U.S. Cl. 250—226 **7 Claims**



A flow-through cell analyzer using a compensating photoelectric circuit indicating the ratio of light passing through a measuring cell and light impinging on the cell. A source of light projects a beam which is controlled, for example, by different filters and which is split into two equivalent beams going to respective photoelectric cells the outputs of which are compared, one of the cells providing a reference voltage which is kept constant by varying the intensity of the light source or by the use of filters or diaphragms.

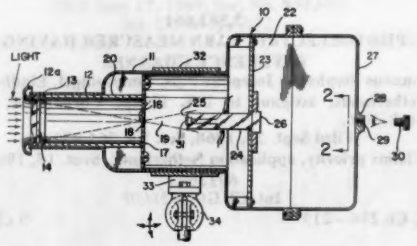
3,582,665
LATCHING THRESHOLD DETECTOR
Edward F. Prozeller, Silver Spring, Md., assignor to the United States of America as represented by the Secretary of the Navy
Filed Aug. 16, 1968, Ser. No. 753,259
Int. Cl. H03k *5/20, 3/26*
U.S. Cl. 307—235 **8 Claims**

A trigger circuit for providing an output signal in response to an input signal only when said input signal meets a predetermined set of requirements. An input signal is fed, in parallel, to two class A emitter followers. Each emitter follower is associated with a respective dual-transistor circuit, one circuit effecting the positive trigger level and the other effecting the negative trigger level. The trigger levels depend solely on the emitter-to-base voltage required to turn on the controlling transistors and therefore the trigger levels are independent of variations in the supply voltage. In one embodiment, the instant circuit serves as a zero-crossing detector;



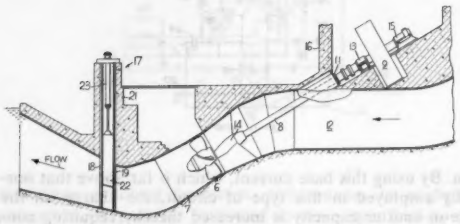
and in another embodiment it serves as a general amplitude detecting circuit.

3,582,666
LIGHT BEAM ALIGNMENT AND PHOTOELECTRIC RECEIVER APPARATUS
Willard Geiger, Jeannette, Pa., assignor to Erico Products, Inc., Cleveland, Ohio
Filed Oct. 18, 1968, Ser. No. 768,840
Int. Cl. G01j *1/42, 3/14*
U.S. Cl. 250—226 **8 Claims**



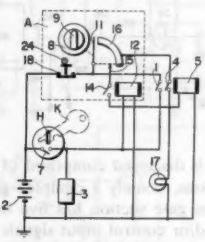
This invention relates to a photoelectric receiver which includes a housing, a lens mounted at one end of the housing and arranged to receive a light beam from a suitable source of light, a photoelectric cell spaced from said lens and supported and surrounded by material capable of transmitting light, an iris plate mounted between the lens and the photoelectric cell at the focal point of the lens and means for making observations of the characteristics of the light transmitted by the light transmitting material surrounding the photoelectric cell.

3,582,667
METHOD OF STARTING HYDRAULIC TURBINE GENERATORS
Howard A. Mayo, Jr., York, Pa., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Oct. 17, 1968, Ser. No. 768,443
Int. Cl. H02p *9/04*
U.S. Cl. 290—52 **5 Claims**



The method of starting a hydraulic turbine generator with a valve located in the draft tube of the turbine.

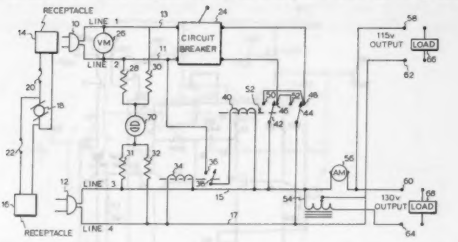
3,582,668
ANTITHEFT DEVICE FOR MOTOR VEHICLES
Yasutaka Kawase, Kyoto, Japan, assignor to Kawase Technical Research Co., Ltd., Nagoya, Japan
Filed May 26, 1969, Ser. No. 827,559
Claims priority, application Japan, May 27, 1968, 43/35820
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 **12 Claims**



Antitheft device for motor vehicles having a key switch connected in series between a power source and an ignition circuit, a remote-controlled switch connected in parallel with the key switch, a self-retaining relay which serves to retain the remote-controlled switch closed, a time switch provided in the circuit of the self-retaining relay to release said self-retaining relay after lapse of a specific time, and a relay network which energizes the said self-retaining relay when the said key switch is closed and said time switch is set concurrently.

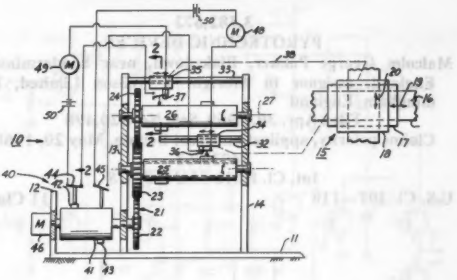
3,582,669
CIRCUIT ARRANGEMENT FOR AUTOMATICALLY CORRECTLY CONNECTING TWO TWO-WIRE LINES RESPECTIVELY CONNECTED TO A SOURCE OF POWER, IN PARALLEL
Edward J. Dempsey, Huntington Beach, Calif., assignor to Concrete Cutting Equipment Co. Inc., Hawthorne, Calif.
Filed Nov. 20, 1969, Ser. No. 878,431
Int. Cl. H02j *3/38*
U.S. Cl. 307—18 **7 Claims**

A circuit arrangement is provided for interconnecting wall electrical outlets so that equipment which draws current which exceeds the fused capacity of any one line supplying



current to each of the wall electrical outlets may be employed.

3,582,670
MULTICHANNEL SEQUENCING SYSTEM
Paul J. Weaver, San Marino, Calif., assignor to Automatic Control Systems, Inc., El Monte, Calif.
Filed Mar. 17, 1969, Ser. No. 807,639
Int. Cl. A02b *1/24*
U.S. Cl. 307—112 **5 Claims**

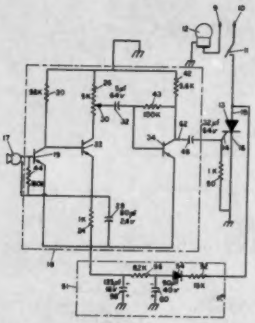


A multichannel sequencing system for a machine tool element which is shiftable along a respective axis. A rotatable drum has an axis of rotation and an axially extending surface in which there is a plurality of axially extending slots with stop means axially slideably engaged in the slots. Track means extends axially adjacent to the slots and bear switch means which are operable by engagement with the stops. This switch means is interconnectable with the machine tool element in order that its axial movement will be proportional to that of its respective machine tool element. Second switch means is associated with a moveable surface whose position is indexed to the rotary position of the drum so as to actuate the second switch means when the first switch means is to be effective. A plurality of axes of machine tool elements may be controlled by providing more than one drum and more than one of said second switch means.

3,582,671
SOUND-RESPONSIVE LIGHT
James H. Ott, Columbus, Ohio, assignor to Novar Electronics Corporation, Barberton, Ohio
Filed July 7, 1969, Ser. No. 839,524
Int. Cl. H01h *37/00*
U.S. Cl. 307—117 **10 Claims**

A sound-responsive light illuminated by an audio-actuated serially connected switch. The audio-actuated switch includes a thyristor, preferably an SCR, the gate of which is triggered by an audio frequency signal from a microphone and audio amplifier. The amplifier is a class A audio amplifier with biasing and loading provided so that the light will be illuminated by sound above a selected level. A nonlinear potentiometer is used for the load impedance of one of the

amplifier stages to permit selection of the desired audio level which triggers the thyristor. The input terminals of a rectified power supply are connected across the principal terminals of the SCR so that the parallel combination may be connected



in series with the electric light and an alternating current power source. Coupling is provided from the output of the audio amplifier to the gate of the thyristor by means of a series capacitor and a shunt gate resistor of approximately 1000 ohms.

3,582,672

PYROTECHNIC DEVICES

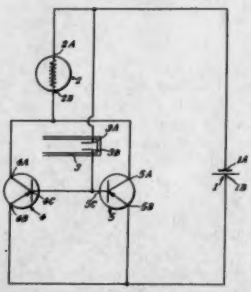
Malcolm George Palmer, Blakedown, near Kidderminster, England, assignor to Albright & Wilson Limited, Birmingham, England

Filed Apr. 30, 1969, Ser. No. 820,498

Claims priority, application Great Britain, May 20, 1968, 24030/68

Int. Cl. H01h *35/24, 29/28*

U.S. Cl. 307—118 **11 Claims**



Electrical pressure switches for submarine use comprise two terminals set inside a capillary tube closed at one end and connected through the tube to an external circuit, which preferably comprises an amplifier. On submergence water reaches the terminals and closes the switch at a given depth, determined by the position of the terminals in the tube.

3,582,673

INTERFERENCE-FREE MULTIVIBRATOR SWITCHING CIRCUIT USING SATURATED UNDOPED TRANSISTORS WITH LARGE BASE-TO-EMITTER CAPACITY

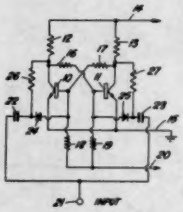
Kenneth Hubert Clayson, and Anthony Waddington-Morris, both of Birmingham, England, assignors to Wilmot-Breeden Limited, Birmingham, England

Filed Oct. 30, 1968, Ser. No. 771,722

Int. Cl. H02h *7/20*

U.S. Cl. 307—202 **3 Claims**

In a multivibrator-type switching circuit using transistors which are switched from a cutoff to a saturation condition, the base circuit of each transistor is arranged to supply to the base of the transistor, when the latter is in a saturated condition, a current which is at least five times, typically between five and 10 times, the maximum collector current of the transistor divided by the minimum common emitter current



gain. By using this base current, which is far above that normally employed in this type of circuit, the charge on the base-to-emitter capacity is increased thereby requiring considerably higher energy to cause malfunction. The circuit is thus much less susceptible to misoperation due to interferring signals than prior types of circuits.

3,582,674

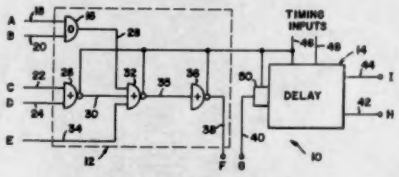
LOGIC CIRCUIT

Alan E. Pound, Sunnyvale, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Aug. 23, 1967, Ser. No. 662,761

Int. Cl. H03k *19/08*

U.S. Cl. 307—203 **20 Claims**



A logic circuit is disclosed comprised of two separate but connectable sections, namely a complex gate section and a delay section. The gate section has five input terminals for receiving data and/or control input signals and a single output, the delay section having a single input and two outputs providing a 1-bit delay output and a complemented 1-bit delay. By means of various interconnections the circuit can provide a wide range of functional devices including various flip-flop arrangements with clear and load capabilities.

3,582,675

ELECTRONIC SWITCHING ARRANGEMENT

William D. Jordan, Jr., Newtonville, and Richard J. Gurski, Lincoln, both of, Mass., assignors to Teledyne, Inc., Los Angeles, Calif.

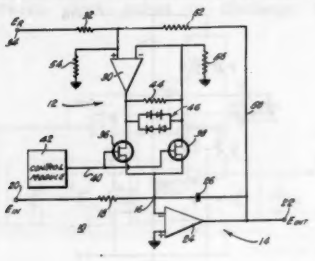
Filed May 3, 1968, Ser. No. 726,334

Int. Cl. G06g *7/12*

U.S. Cl. 307—230 **5 Claims**

Electronic gating or switching arrangement. A first transistor is connected between the output of an amplifier and an output lead; when on, the transistor provides a direct connection between the amplifier and the output lead, when the transistor is off the amplifier is disconnected from the lead. To minimize the "full-on" resistance of the transistor, a feedback path between the output lead and the input of the amplifier is provided by a second transistor which is turned on when the first is turned on, and off when the first is turned

off. Feedback control of the amplifier is provided independently of the two transistors by a resistor connected between the output and input of the amplifier. This arrangement



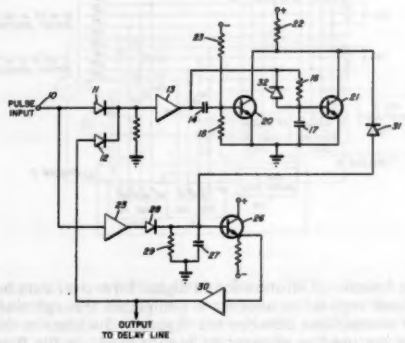
minimizes switching transients, and reduces to negligible amount the impedance presented to the output lead by the amplifier when gated "on."

3,582,676

PULSE LENGTH NORMALIZING AND SHORT PULSE ELIMINATING CIRCUIT

Erik Rosenbaum, Randallstown, Md., assignor to The Bendix Corporation

Filed Sept. 24, 1968, Ser. No. 762,008
Int. Cl. H03k *5/20*
U.S. Cl. 307—234 **5 Claims**



A differentiating circuit and an integrating circuit are combined in a logic gate to suppress transmission of pulses whenever an effective output appears from either circuit. The time constant of the differentiator determines minimum length and that of the integrator determines maximum length of transmitted pulses.

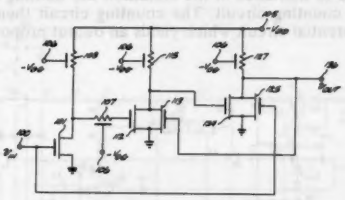
3,582,677

PULSE SPACING DISCRIMINATOR CIRCUIT

Carroll R. Perkins, Balboa Island, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 16, 1969, Ser. No. 885,515
Int. Cl. H03k *17/28*
U.S. Cl. 307—234 **7 Claims**

A pulse spacing discriminator circuit may be formed on a single semiconductor substrate utilizing five MOS field effect transistors and a maximum of four field effect transistor switch resistors. The circuit provides an output pulse if the spacing between successive input pulses is greater than a



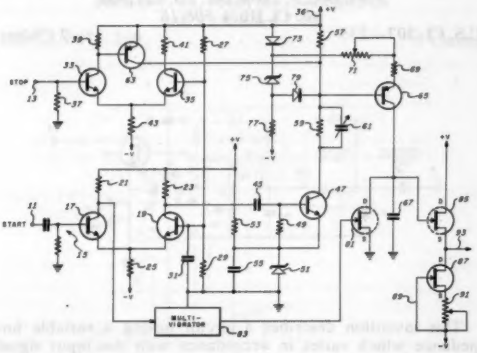
predetermined time interval. The output pulse terminates upon receipt of the next input pulse.

3,582,678

PULSE INTERVAL MEASUREMENT APPARATUS

David C. Davis, Jr, Clearwater, and Carl T. Nations, St. Petersburg, both of, Fla., assignors to Sperry Rand Corporation

Filed Aug. 6, 1969, Ser. No. 848,771
Int. Cl. H03k *5/20*
U.S. Cl. 307—234 **8 Claims**



First and second transistor switching pairs are connected to receive first and second pulses respectively. Each switching pair is biased to respond only when the instantaneous value of the appropriate pulse exceeds a predetermined threshold. A capacitor is charged through a constant current network from the time that the first switching pair is actuated until the time that the second switching pair is actuated so that the magnitude of the charge on the capacitor represents the time interval between pulses. Individual halves of a dual FET are connected in hold and discharge circuits across the capacitor.

ERRATUM

For Class 307—235 see:
Patent No. 3,582,665

3,582,679

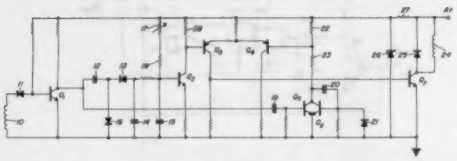
SPEED SENSITIVE CONTROL CIRCUIT

Ralph W. Carp, Baltimore, Md., and Ralph M. Miller, Hellam, Pa., assignors to The Bendix Corporation

Filed Oct. 29, 1968, Ser. No. 771,580
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **1 Claim**

A control circuit for maintaining a detected condition at a maximum level. The condition, for example, the speed of an automobile, is detected by a sensor which includes a rotating magnet and a sensing coil. The rotation of the magnetic field

is proportional to the velocity of the automobile and therefore the output frequency of the sensing coil is directly proportional to the speed of the vehicle. As the sensor output increases due to increases in the condition the limiting circuit actuates a counting circuit. The counting circuit then actuates a differential circuit which yields an output proportional



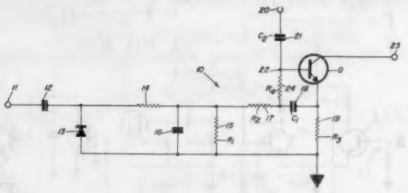
to the detected condition. When the output of the difference circuit is above a predetermined level the current in an actuating coil is reduced to zero and full control is realized. When the output of the sensor is below a set level, current in the coil is a maximum and no limiting occurs. For conditions between the two extremes partial control is realized.

3,582,680

VARIABLE IMPEDANCE CIRCUIT

Michael Slavin, Baltimore, Md., assignor to The Bendix Corporation

Filed Dec. 5, 1968, Ser. No. 781,546
Int. Cl. H03k *508/18*
U.S. Cl. 307—235 **2 Claims**



This invention describes a circuit having a variable impedance which varies in accordance with the input signal level. The inventive circuit is used in conjunction with the deemphasis circuit ordinarily employed in FM and other types of radio receivers. By varying the impedance between the output of the deemphasis circuit and the ground, the sensitivity of the audio frequency stage of the receiver is automatically varied. The variation in sensitivity increases the receiver's ability to reject interference and weak signals. The inventive circuit includes two parallel impedance paths connected between the output of deemphasis circuit and the ground reference. The first path is a fixed impedance path and the second contains a voltage sensitive switch. The impedance of the second path is a function of the current through the voltage sensitive switch and therefore the receiver sensitivity varies directly with the variation in current through the switch when the switch is in a conductive condition.

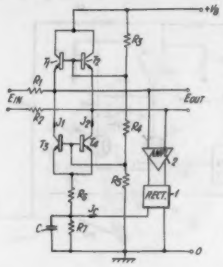
3,582,681

VARIABLE LOSS DEVICE

Peter Norman, Dartford, and Camilo Manansala Tabalba, Basildon, both of, England. assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,509
Claims priority, application Great Britain, Oct. 30, 1968, 51485/68
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **3 Claims**

A transistorized AGC device is proposed for telephone subscriber sets using integrated circuit techniques. The variable loss circuit comprises two transistors bridging the transmission path. The magnitude of the impedance of the emitter-base junction is controlled by injecting a current, the magnitude of which can be varied. The control current is provided by a high impedance (constant current) source



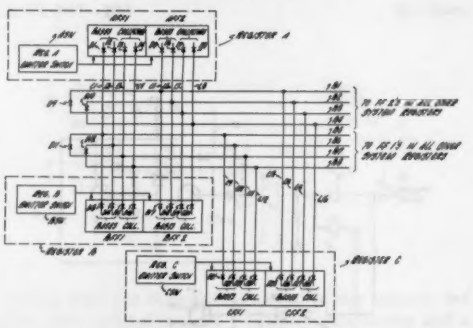
realized by two further transistors in grounded base configuration. These transistors present a high impedance to the signal currents and avoid interaction between the signal and control currents.

3,582,682

DATA BUS TRANSFER SYSTEM

James C. Carroll, Raleigh, N.C., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 14, 1969, Ser. No. 790,927
Int. Cl. H03k *17/74*
U.S. Cl. 307—259 **9 Claims**



The transfer of information in digital form over data busses from one register to another is completed through multiple diode connections between the registers. Switches in the registers are used to change the bias applied via flip-flop circuits to the diodes connected between the registers thereby causing the diodes to become conductive and transfer data from flip-flops in one register to flip-flops in a second register.

3,582,683

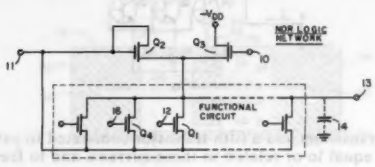
OPTIONALLY CLOCKED TRANSISTOR CIRCUITS

George V. Podraza, Canoga Park, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Aug. 9, 1968, Ser. No. 751,596
Int. Cl. H03k *17/00*
U.S. Cl. 307—251 **15 Claims**

Inverting switching and logic function circuits for digital equipment are provided in networks with an option for phase clocking by including first and second insulated-gate (MOS), field-effect transistors having their source connected to the functional circuit output terminal. The drain and gate of the first transistor are adapted to be connected to a clock source for clocked mode of operation and to circuit ground for nonclocked mode of operation. The gate of the first transistor is also so connected to the functional circuit as to provide circuit ground thereto permanently for a nonclocked mode of

operation, and to provide clock pulses thereto for a clocked mode of operation, such that the functional circuit is biased off in reference to circuit ground potential during clock pulses to charge stray capacitance at the functional circuit output terminal, but enabled as a function of one or more input signals between clock pulses to discharge the stray



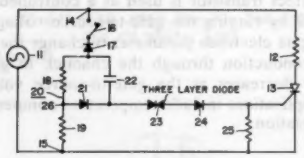
capacitance. The second transistor connected to the output terminal is adapted to be biased for conduction as a load transistor when the first transistor is connected to circuit ground such that the stray capacitance is then charged through the load transistor and discharged through the circuit as a function of one or more input signals in a non-clocked mode of operation for the network.

3,582,684

ZERO POINT SWITCHING CIRCUIT FOR INITIATING CONDUCTION OF SILICON-CONTROLLED RECTIFIERS

Robert E. Gregson, Scottsdale, Ariz., assignor to Motorola Inc., Franklin Park, Ill.

Filed Jan. 21, 1969, Ser. No. 792,586
Int. Cl. H03k *17/00*
U.S. Cl. 307—252UA **9 Claims**



A zero point switching circuit for an SCR coupled in circuit relation with an AC source and a load is described. The combination of a switch, a first diode and a voltage divider is coupled across the source. The variable tap or terminal of the divider is coupled through a second diode and a capacitor to the first diode. When the switch is closed, the capacitor charges during one-half cycle toward a voltage level determined by the divider. The discharge path for the capacitor is provided by a three-layered diode coupled between the gate electrode of the SCR and the capacitor. When the line voltage decreases prior to the next half cycle, the capacitor voltage extends the threshold level of the three-layered diode. As a result, the diode becomes conductive thereby turning on the SCR at the zero point of the AC voltage.

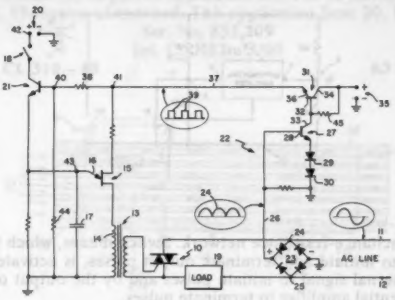
3,582,685

ZERO CROSSOVER FIRING OF THYRISTOR MEANS

Lester N. Bolmgren, Richfield, Minn., assignor to Honeywell Inc.,, Minneapolis, Minn.

Filed Apr. 29, 1969, Ser. No. 820,252
Int. Cl. H03k *17/00, 1/16*
U.S. Cl. 302—252 **7 Claims**

The firing of an alternating current energized triac is controlled by a unijunction transistor. Both the base-to-base voltage and the triggering voltage of the unijunction transistor are supplied and controlled by a power supply which is synchronized to the alternating current source, such that the triac fires at near zero crossover of the alternating current.



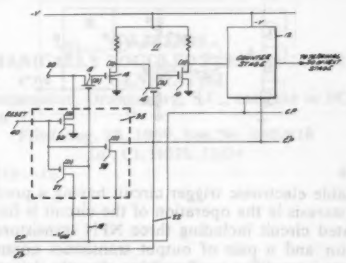
The firing is delayed, to occur approximately 3° after zero crossover, to insure latching current flow through the triac.

3,582,686

RESET CIRCUIT FOR A MULTISTAGE COUNTER

Carroll R. Perkins, Balboa Island, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 16, 1969, Ser. No. 885,516
Int. Cl. H03k *17/00*
U.S. Cl. 307—269 **3 Claims**



A reset circuit for a multistage counter of the type clockable by clock pulses, successively applied on two clock lines, includes two MOS FET's which, when rendered conductive by the application of an appropriate potential to their gate electrodes, effectively electrically connect the clock lines to a potential supplying terminal, thereby applying a clocking potential to the lines. The circuit includes a third MOS FET, which is used to apply a logic 0 level to the input terminal of the first counter stage. The respective gate electrodes of the three MOS FET's are connected to a reset line so that a reset pulse on this line activates the three MOS FET's.

3,582,687

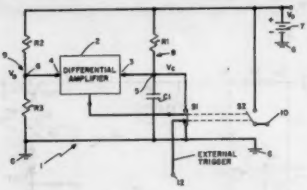
MONOSTABLE AND ASTABLE MULTIVIBRATOR APPARATUS INCLUDING DIFFERENTIAL AMPLIFIER, RC NETWORK AND SWITCH MEANS FOR INITIATING AND TERMINATING OUTPUT PULSES

Antonio F. Bellomo, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 15, 1969, Ser. No. 841,791
Int. Cl. H03k *3/10, 3/26*
U.S. Cl. 307—273 **10 Claims**

Monostable multivibrator apparatus (one shot) is disclosed which was conceived to fill the need for a reliable, stable, low-power pulse generator that is not sensitive to temperature and supply-voltage variations. In one embodiment, two of the monostable multivibrators are connected in a closed-loop configuration for use as an astable low frequency clock generator. To provide stability the monostable includes a dif-

ferential amplifier having one input connected to a reference input voltage (midpoint of a resistance voltage divider), the other input receiving a pulse-width determining voltage from



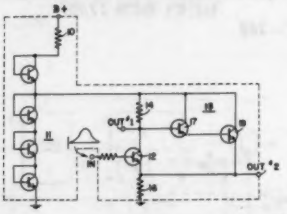
a capacitance-resistance network. Switch means, which functions to initiate and terminate output pulses, is activated by an external signal to initiate pulses and by the output of the differential amplifier to terminate pulses.

3,582,688

CONTROLLED HYSTERESIS TRIGGER CIRCUIT

Francis H. Hilbert, River Grove, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 6, 1969, Ser. No. 797,000
Int. Cl. H03k *3/26*
U.S. Cl. 307—272 **6 Claims**



A stable electronic trigger circuit having a predetermined DC hysteresis in the operation of the circuit is formed as an integrated circuit including three NPN transistors: an input transistor and a pair of output transistors connected in a Darlington amplifier configuration directly driven from the collector of the input transistor. Operating potential for the trigger circuit is obtained from the voltage drop across a string of series connected transistor diodes, and the input transistor has collector and emitter resistors connected to it, with the collector resistor having an impedance many times that of the emitter resistor. The switching levels of the trigger circuit are determined by the ratio of the collector and emitter resistors in the input transistor circuit and/or by the base-emitter voltage drops across the transistors.

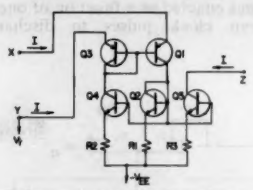
3,582,689

CURRENT CONVEYOR WITH VIRTUAL INPUT REFERENCE POTENTIAL

Kenneth C. Smith, Weston, Ontario, and Adel S. Sedra, Toronto, Ontario, both of, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Oct. 23, 1968, Ser. No. 769,798
Int. Cl. H03k *1/12*; H03f *3/04*
U.S. Cl. 307—297 **2 Claims**

A basic circuit comprising a first transistor having an input terminal for introduction of a current, an output connected to a diode-connected second transistor, and a control electrode connected to the control electrode of a diode-connected third transistor whose output is adapted for connection to a reference potential source and whose input is connected to the output of a fourth transistor, with the control electrodes of the second and fourth transistors interconnected and the output of the second and the input of the fourth transistors connected via equal resistors to a power supply source such that the current flowing in the first and second transistors is equally reproduced in the third and



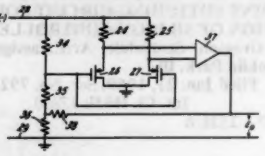
fourth transistors and a fifth transistor connected to extract a current equal to or related to these currents and to feed it to an output terminal.

3,582,690

SEMICONDUCTOR STRAIN SENSOR WITH CONTROLLED SENSITIVITY

Alexander J. Yerman, Scotia, N.Y., assignor to General Electric Company

Filed June 9, 1969, Ser. No. 831,472
Int. Cl. H03k *17/00*
U.S. Cl. 307—308 **6 Claims**



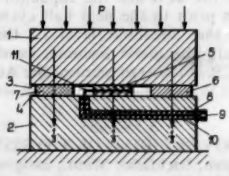
A field effect transistor is used as a controlled sensitivity strain sensor by varying the gate-to-source voltage or other equivalent gate electrode parameter to change the strain sensitivity of conduction through the channel. In general, the gage factor decreases as the gate-to-source voltage is increased. Applications include temperature compensation and scale linearization.

3,582,691

FORCE TRANSDUCER UNITS WITH MULTIPLE SENSING ELEMENTS

Hans Conrad Sonderegger, Neftenbach; Gelli Spescha, and Karlheinz Martini, Winterthur, all of, Switzerland, assignors to Kistler Instrumente AG, Winterthur, Switzerland

Filed July 30, 1969, Ser. No. 846,021
Claims priority, application Switzerland, July 30, 1968, 11447/68
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.4 **10 Claims**



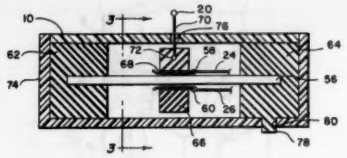
A transducer unit in which the force or forces to be measured, are divided at a predetermined ratio by the use of at least one piezoelement and at least one idle element, of substantially similar thicknesses and characteristics, which are disposed between the force-transmitting supports.

3,582,692

RESILIENTLY SUPPORTED SENSING TRANSDUCER

Oscar Palini, Camp Springs, Md., assignor to U.S. Research Corporation, Washington, D.C.

Filed May 1, 1968, Ser. No. 725,849
Int. Cl. H02v *7/00*; H02r *17/00*
U.S. Cl. 310—8.5 4 Claims



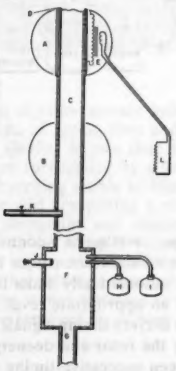
An improved sensing transducer is provided which may be used to provide a signal in response to a change in an external pressure. The transducer is particularly effective when connected to a circuit with an alarm so that it may be used as a security device. The sensing transducer has a piezoelectric element, a pair of electrodes positioned on opposite sides of the element to pick up current from a voltage created across the element in response to mechanical stress upon the element, a supporting means connected to the element for supporting at least a portion of the element against movement, and an actuator means connected to the element for applying pressure to at least a portion of the element to create a stress in the element in response to the change in pressure to be sensed.

3,582,693

CONDUCTIVE FLAME VARIABLE CAPACITY GENERATOR

Louis Richard O'Hare, 270 Indiana, N.E., Alburuerque, N. Mex.

Filed Oct. 10, 1968, Ser. No. 766,447
Int. Cl. H02m *3/00*
U.S. Cl. 310—10 3 Claims



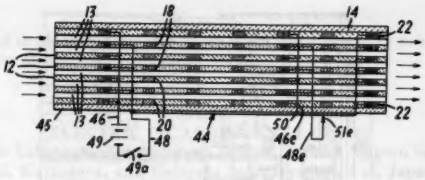
In the conductive flame variable capacity generator, the electrostatic capacity existing between two spheres of opposite charge is changed by a pulsed electrically conductive gas. Current flow resultant in the conductive gas which the pulse of gas is effecting, is coupled by means of a type of capacitor inside one of the spheres to a transformer attached to the sphere. Each pulse of gas increases and decreases the capacity as it respectively moves in and then through the space between the spheres and each corresponding surge of current is brought out through the transformer in electrical series with this action.

3,582,694

ELECTROGASDYNAMIC SYSTEMS AND METHODS

Meredith C. Gourdine, West Orange, N.J., assignor to Gourdine Systems, Incorporated, Livingston, N.J.

Continuation-in-part of application Ser. No. 601,270, Nov. 15, 1966, now abandoned. This application June 20, 1969, Ser. No. 835,209
Int. Cl. H02m *3/00*
U.S. Cl. 310—10 63 Claims



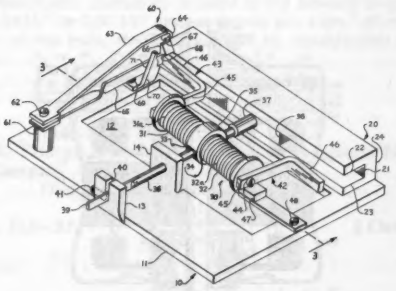
Electrogasdynamic systems in which a plurality of slender gas flow channels carry electrical charges to a downstream charge collector. Each flow channel is of elongate cross section, and the elongate dimension thereof may progressively increase from one end of the channel to the other. Electrical charges are injected into the flow by a corona discharge established in the flow between attractor and corona discharge electrodes extending laterally across the flow in the direction of elongation of the channel cross section and located preferably at the channel side. Adjacent channels are defined by spaced dielectric plates or by spaced rows of conductive wires mutually spaced in the direction of flow and connected externally to an electrical biasing or current-carrying circuit.

3,582,695

MECHANICALLY TOGGLED ELECTRICAL PULSE GENERATOR

John Wannamaker, Orangeburg, S.C., assignor to SCM Corporation

Filed Aug. 18, 1969, Ser. No. 850,818
Int. Cl. H02k *35/04*
U.S. Cl. 310—15 6 Claims



This disclosure relates to a mechanically toggled electrical pulse generator for generating pulses of electrical energy. More particularly, this invention includes a permanent magnet having a coil armature operatively associated therewith. The coil armature includes two oppositely directed magnet attraction elements with the armature supported for movement relative to the permanent magnet between a first position where a flux path is developed through the armature in a first direction and to a second position where the flux path is directed in an opposite direction. The pulse generator includes mechanically toggled elements for moving the coil armature between the first and second position in a rapid sequence to thereby effect a rapid change in the flux density in the coil armature and generate a pulse of electrical energy at output leads associated therewith.

3,582,696

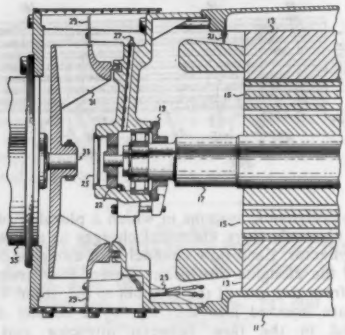
DYNAMOELECTRIC MACHINE WITH A SOLID IRON ROTOR

George M. Rosenberry, Jr., Elnora, N.Y., assignor to General Electric Company

Continuation of application Ser. No. 717,603, Apr. 1, 1968, now abandoned. This application Jan. 5, 1970, Ser. No. 504

Int. Cl. H02k *1/32*

U.S. Cl. 310—61 1 Claim



A dynamoelectric machine has a stator and a rotor. The rotor is solid cast iron. A plurality of holes are formed in the rotor in four peripheral regions to divide the rotor into a plurality of peripheral flux paths. The heat in the rotor is dissipated by drawing high-velocity air through the holes by a fan.

3,582,697

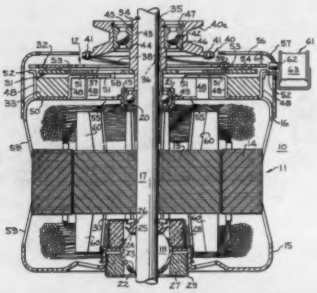
COMBINATION MOTOR-CLUTCH APPARATUS

John Bochan, and Robert M. Fey, both of Louisville, Ky., assignors to General Electric Company

Filed Jan. 28, 1970, Ser. No. 486

Int. Cl. H02k *7/10*

U.S. Cl. 310—78 5 Claims



A combination motor-clutch apparatus in which an electrically operated clutch is arranged in an integral assembly with a driving motor. The control member of the clutch comprises an electromagnetic coil which induces a magnetic field for bringing the clutching surfaces into operative engagement. The coil is mounted on an end shield of the motor by means of tabs which are pierced out of the end shield. The tabs additionally serve as a flux path for passing the magnetic field of the coil to the movable clutch means, while the openings in the end shield created by the formation of the tabs provide a means for cooling airflow to pass through the clutch and the motor.

3,582,698

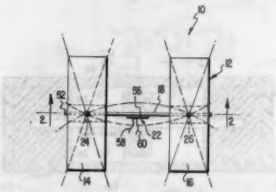
RESONATOR WITH COUNTERROTATING RIGID PARTS

Hugh M. Baker, Jr., 5005 Nebraska Ave., Washington, D.C.

Filed June 24, 1969, Ser. No. 836,026

Int. Cl. H01v *7/00*

U.S. Cl. 310—8.2 4 Claims



A resonator comprising a plurality of rigid pivotable members are interconnected by a flexible member which is arranged to induce counterrotary movement of the rigid members upon driving of one of the members. In order to provide a resonator having a relatively low resonant frequency, the flexible member is relatively long and is connected to the rigid members on opposite sides of the nodal axes thereof.

3,582,699

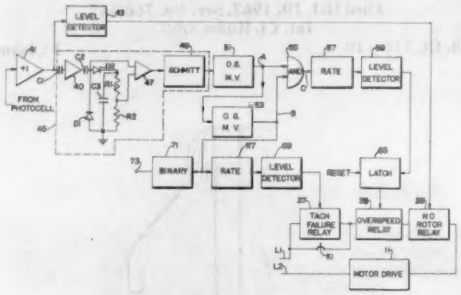
OVERSPEED CONTROL FOR CENTRIFUGE

Rosario S. Badessa, Dedham, and Italo J. De Santis, Medway, both of, Mass., assignors to Damon Engineering, Inc., Needham Heights, Mass.

Filed June 12, 1969, Ser. No. 832,776

Int. Cl. H02p *3/06*

U.S. Cl. 318—327 16 Claims



The centrifuge overspeed control disclosed herein facilitates the use of different rotors having different maximum speeds and automatically limits the rotational speed of the centrifuge to an appropriate level. As the rotor rotates, an optical pickup derives timing signals from first and second indicia carried by the rotor and deenergizes the centrifuge if the interval between successive timing signals drops below a predetermined value.

3,582,700

CYCLOTRON BEAM EXTRACTION SYSTEM

George O. Hendry, Napa, Calif., assignor to Cyclotron Beam Ertraction System, Berkeley, Calif.

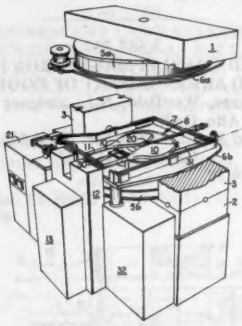
Filed Nov. 12, 1968, Ser. No. 775,027

Int. Cl. H05h *13/08*

U.S. Cl. 313—62 5 Claims

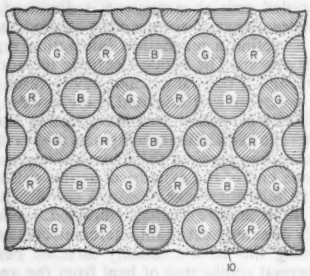
A method and apparatus for extracting a high-quality beam from an isochronous cyclotron by electrostatic deflection of

a beam of charged particles from orbit and subsequent exposure of the beam within the evacuated region of the



cyclotron to a reverse gradient in the normally declining fringe magnetic field.

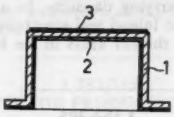
3,582,701
COLOR TUBE SCREEN WITH LIGHT-ABSORBING CERMET DEPOSITS
Nicholas Zeliotis, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed Mar. 27, 1969, Ser. No. 811,060
Int. Cl. H01j *29/18, 9/22*
U.S. Cl. 313—92 **5 Claims**



A shadow mask type of color picture tube has a mosaic screen comprised of dots of green, blue and red phosphors which are individually smaller in size than the apertures of the mask. These dots are surrounded by a deposit of a light-absorbing cermet for absorbing visible ambient light incident on the face of the tube and comprising a mixture of nickel and nickel oxide or aluminum and aluminum oxide. In processing such a screen, the metal is vacuum deposited in an atmosphere of water vapor to cover the entire screen area with a cermet film and thereafter portions of the film overlying elemental areas of the screen intended to receive deposits of phosphor material are removed by etching.

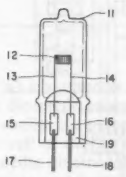
3,582,702
THERMIONIC ELECTRON-EMISSIVE ELECTRODE WITH A GAS-BINDING MATERIAL
Friedrich Hermann Raymund Almer, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 1, 1969, Ser. No. 811,846
Claims priority, application Netherlands, Apr. 4, 1968, 6804720
Int. Cl. H01j *19/68, 19/70*
U.S. Cl. 313—174 **15 Claims**

A thermionic cathode including a support in the form of a metal sheet with an electron-emissive coating on one side and a coating of gas-binding material on the opposite side. The sheet may be formed into a tube and the electron-emissive coating may be on the outside or inside and the gas-binding material on the opposite side. Such cathodes may be em-



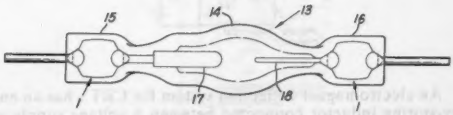
ployed in electric discharge tubes, such as cathode-ray tubes and low-pressure gas-discharge lamps.

3,582,703
ELECTRIC INCANDESCENT LAMP
Tashio Takahashi, Tokyo; Utami Mikami, Gyoda; Shigeru Suzuki, Kumagaya, and Hideyuki Sato, Gyoda, all of, Japan, assignors to Iwasaki Denki Kabushiki Kaisha, Tokyo, Japan
Filed July 31, 1969, Ser. No. 846,475
Claims priority, application Japan, Aug. 13, 1968, May 21, 1969, 43/57260;44/38729
Int. Cl. H01k *1/50*
U.S. Cl. 313—174 **5 Claims**



This invention relates to electric incandescent lamps having a tungsten filament and a bulb made of heat-resistant and pervious material such as quartz glass in which boron tribromide is provided constituting a reactive transport gas for establishing the regenerative cycle in addition to the usual inert gas such as argon and nitrogen. Thereby various faults inevitable in the usual incandescent lamps filled with a regenerative gas in the form of various halogen compounds are avoided or are overcome, and maintain a rather longer life. When boron tribromide is filled in the amount ranging from 0.8×10^{17} to 2.0×10^{15} gram molecule per 1 $cm.^3$ of inner volume of the bulb, the bulb life can be considerably extended.

3,582,704
MANUFACTURE OF FOIL SEALS
Elmer G. Fridrich, Chardon, Ohio, assignor to General Electric Company
Filed June 6, 1968, Ser. No. 734,910
Int. Cl. H01j *5/50*
U.S. Cl. 313—331 **8 Claims**



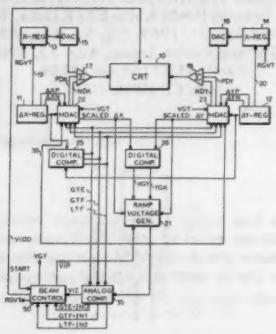
Molybdenum foils for pinch sealing into quartz are etched using shields which protect selected welding areas at each

end from the action of the electrolyte. Etching provides feathered edges all around but leaves thicker areas under the shields to which the inleads and electrodes are welded without any need for extra tabs to facilitate welding or to increase the current-carrying capacity. In a preferred foil-in-lead construction, the inlead and electrode have spade ends coextensive with the thicker areas in the foils to which they are welded.

3,582,705
VECTOR DISPLAY SYSTEM

Robert W. Waller, Northridge, and James F. Gruder, Manhattan Beach, both of, Calif., assignors to Information International, Inc., Boston, Mass.

Filed July 15, 1969, Ser. No. 841,705
Int. Cl. H01j *29/70*
U.S. Cl. 315—18 **11 Claims**

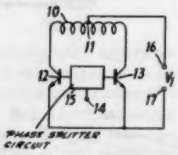


A vector display system is disclosed for use with CRT and similar devices which display a line in a coordinate system. A ramp voltage is multiplied by scaled departure components ΔX and ΔY to assure straight lines, and the ramp rate is selected by an approximation of the line length computed digitally. The ramp voltage is backed up to initially deflect the beam in the opposite direction before ramp generation is initiated and video is turned on. The video-on and video-off times are delayed by constant amounts to allow for lag of the beam deflection system behind the beam deflection signals generated from the sum of analog signals representing present position, and the product of departure data and the ramp voltage. Video turn off is initiated when the ramp voltage crosses a reference which is scaled by the reciprocal of the scaling factor used for the components ΔX and ΔY.

3,582,706
DEFLECTION SYSTEM FOR CATHODE-RAY TUBES

David Hartley Thomas, Elsenham, assignor to A.C. Cossor Limited, Harlow, Essex, both of, England

Filed June 11, 1969, Ser. No. 832,298
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 **12 Claims**

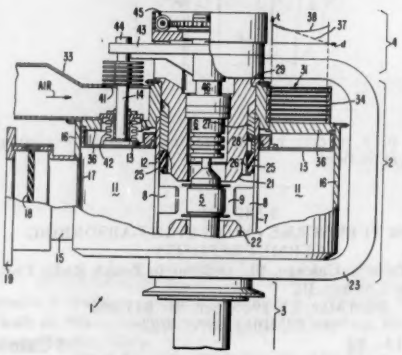


An electromagnet deflection system for CRT's has an energy-storing inductor connected between a voltage supply and a center tapping of a double-ended deflection coil. The system includes circuits responsive to the potentials at the ends of the coil, and when a rapid beam deflection occurs, the passage of one or other potential beyond a predetermined level is detected by the circuits which then cause energy to be removed from the inductors. Energy is replenished in the inductor either when a deflection is over, or in a modification having a switch regulator, simultaneously with the withdrawal of energy from the inductor.

3,582,707
AIR COOLED COAXIAL MAGNETRON HAVING AN IMPROVED ARRANGEMENT OF COOLING FINS

Richard M. Hynes, Westfield, N.J., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 22, 1970, Ser. No. 5,026
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.77 **7 Claims**

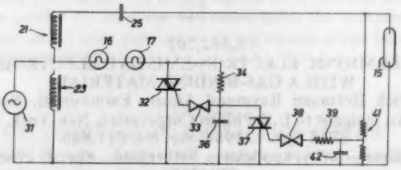


An air cooled coaxial magnetron is disclosed. The magnetron includes a coaxial arrangement of anode and cathode electrodes to define a magnetron interaction region in the space therebetween. The anode electrode includes an anode wave circuit and a coaxial circular cavity resonator with a cylindrical common wall disposed therebetween, such wall having an array of axially directed coupling slots communicating between the circular cavity and the wave circuit for controlling the frequency of the tube. An inner heat shunt is affixed to one end of the cylindrical anode wall and extends axially of the tube for connection to a radially directed heat shunt and to an array of radially directed cooling fins. An outer axially directed heat shunt interconnects the outer ends of the cooling fins to the radially directed heat shunt to enhance thermal conduction of heat from the anode wall to the cooling fins for improved cooling efficiency of the tube.

3,582,708
CONTINUOUS LIGHTING SYSTEMS FOR GASEOUS-DISCHARGE LAMPS WITH INCANDESCENT LAMPS ON STANDBY

Carl R. Snyder, Alief, Tex., assignor to Esquire, Inc.

Filed Feb. 25, 1969, Ser. No. 801,953
Int. Cl. H05b *39/10, 41/46*
U.S. Cl. 315—91 **13 Claims**



An improved continuous lighting system for gaseous-discharge lamps which provides immediate lighting of incandescent light facilities upon extinguishment of the gaseous-discharge lamp. The lighting system further provides a delay, after reignition of the gaseous-discharge lamp, to maintain

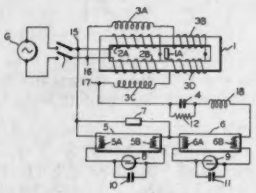
the incandescent lights lit until the gaseous-discharge lamp warms up and reaches a predetermined intensity, then the incandescent lights are extinguished.

3,582,709

PLURAL FLOURESCENT LAMP STARTING CIRCUIT USING AN UNIGNITED LAMP AS BALLAST AND A FLUX LEAKAGE TRANSFORMER AS TO OBTAIN SUITABLE CONTROL VOLTAGES

Shungo Furui, 1394 Namamugi-cho, Surumi-ku, Yokohama, Japan

Filed Sept. 9, 1968, Ser. No. 758,461
Claims priority, application Japan, Sept. 23, 1967, 42/061141
Int. Cl. H05b *41/18*; H01f *27/28*
U.S. Cl. 315—96 **3 Claims**



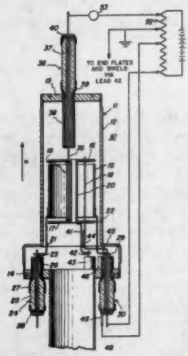
A starting system for gaseous discharge devices, in which a transformer is used, comprising a magnetic core having two sections, a plurality of primary windings wound about one section, and a plurality of secondary windings, one portion wound about the one section commonly with the primary windings, and another portion wound about the other section, with suitable connections of the secondary windings to the discharge devices. The split secondary windings on different sections of the core, acts as a transformer and ballast choke.

3,582,710

ULTRAHIGH VACUUM MAGNETRON IONIZATION GAUGE WITH FERROMAGNETIC ELECTRODES

Louis J. Favreau, Elnora, N.Y., assignor to General Electric Company

Filed May 22, 1969, Ser. No. 826,815
Int. Cl. H01j *7/16, 17/22*; G01n *27/62*
U.S. Cl. 315—108 **9 Claims**



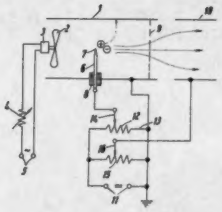
A magnetron ionization gauge having the capability of measuring ultrahigh vacuum of the order of 2×10^{-11} torr with high sensitivity and conversion constant is formed with a hollow cylindrical anode and an electron-containment ferromagnetic plate at either end of the anode. An ion-collector is centrally located within a cylindrical anode and extends the entire length thereof. An electron-emitting cathode is located off center between the ion-collector and the anode wall and parallel to the longitudinal axis. An ion-collector shield extends the entire length of the ion-collector and is interposed between the ion-collector and the electron-emitting filament. The device is biased well beyond cutoff to provide restricted curvilinear paths for ionizing the electrons circulating around inside the anode.

3,582,711

ARRANGEMENT FOR PRODUCING UNIPOLAR AIR IONS

Herbert Jahnke, Unterthingau, Allgau, Germany, assignor to Constantin G. Von Berckheim, Weinheim, Bergstrasse, Germany

Filed Oct. 9, 1968, Ser. No. 766,126
Claims priority, application Germany, Oct. 9, 1967, 1,679,532
Int. Cl. H05b
U.S. Cl. 317—4 **7 Claims**



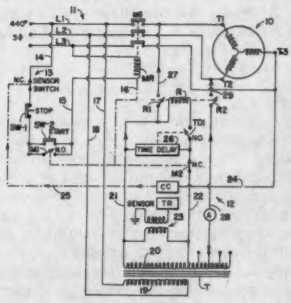
An arrangement by which unipolar air ions are realized. A mass of moving air is directed through an air duct, through the action of a fan or similar air pump. A needle electrode is mounted through the wall of the air duct and in the path of the moving air. The needle electrode is electrically insulated from the walls of the duct and from ground potential. A DC voltage supply applies a potential to the electrode and ground potential to the walls of the air duct. The potential applied to the electrode is such that it is just equal to the ionization field strength or exceeds this quantity by only a slight amount. As a result of the high concentration and density of field lines at the needle point of the electrode, ionization is realized so that ions of one polarity are attracted to the walls of the air duct and the ions of opposite polarity are directed through and out of the air duct. Deflection electrodes at the exit of the air duct deflect the ions of desired polarity and regulate the ion density of the ion stream.

3,582,712

MOTOR HEATING UNIT WITH POWER FAILURE CONTROL RESPONSIVE TO AN UNHEATED CONDITION OF THE MOTOR

Darrell J. Blair, Solvang, Calif., assignor to M & B Electric Co., Inc.

Filed Apr. 27, 1970, Ser. No.32,075
Int. Cl. H02h *7/08*
U.S. Cl. 317—13R **5 Claims**



A motor heating unit is provided with power failure control for maintaining an electric motor in a warm condition

after the motor has been turned off and preventing reapplication of power after a power failure until the motor is heated. An auxiliary source of electrical energy derived from the main input power source is automatically connected to the motor windings in response to turning off of the motor to thereby heat the motor and prevent the accumulation of moisture and the like. When the motor is turned on, the auxiliary heating means is disconnected. In the event of a power failure and a subsequent reapplication of power, the reapplication of power is prevented by a sensor means responsive to the condition of the motor until such time as the auxiliary electrical heating means for the motor has had time to heat the motor.

3,582,713

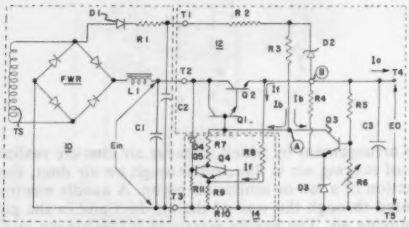
OVERCURRENT AND OVERVOLTAGE PROTECTION CIRCUIT FOR A VOLTAGE REGULATOR

James Peter Till, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 16, 1970, Ser. No. 19,567

Int. Cl. H02h *3/20*; **G05f** *1/58*

U.S. Cl. 317—31 **6 Claims**



A combined overload and overvoltage protective circuit for solid state devices which utilizes two transistors in a NOR logic gate configuration that is held normally off by a common emitter bias supplied through a feedback current developed from voltage supplied to a load. Either transistor is switched on to shunt supply current away from solid state devices of the circuit during an overload or input overvoltage condition.

In case of overload, excessive load current causes the development of an increased drop across the base-emitter circuit of one transistor countering the hold off bias developed from the feedback current.

An input overvoltage causes a Zener diode to conduct and to develop an increased drop across base-emitter of other transistor countering the same hold off bias developed from the feedback current.

3,582,714

MULTIPLE-OUTPUT CHASSIS-LESS POWER SUPPLY HAVING A HEAT DISSIPATING HOUSING OF UNITARY CONSTRUCTION

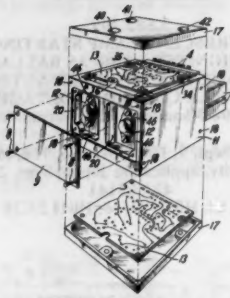
Benjamin Shmurak, Lynbrook; Richard Projain, Syosset; Thomas Kelleher, Farmingdale, and Maurice Paulson, Huntington, all of, N.Y., assignors to Lambda Electronics Corporation, Huntington, N.Y.

Filed July 24, 1969, Ser. No. 844,552

Int. Cl. H02b *1/08*, *1/18*

U.S. Cl. 317—100 **6 Claims**

A multiple-output power supply which utilizes its die-cast housing as its heat dissipating means and eliminates the need for a separate chassis by having the power supply components affixed directly to the die-cast housing. Printed circuit boards are positioned about a transformer which is in thermal conductive relationship with the die-cast housing due to the utilization of transformer mounting brackets which pass through the center of the transformer. Power transistors are externally accessible, being recessed in heat conductive relationship with the die-cast housing. Miniaturized barrier strips appear externally across one face of the die-cast housing. The barrier strips have insulating spacers between conductive terminals which not only insulate the conductive thermals from each other but also from externally mounted conductive accessories. Cover plates are detachably affixed to said die-cast housing over the printed circuit boards creating a chassis-less power supply, rectangular in shape, compact in size, multipositional in mounting and easily serviced.



3,582,715

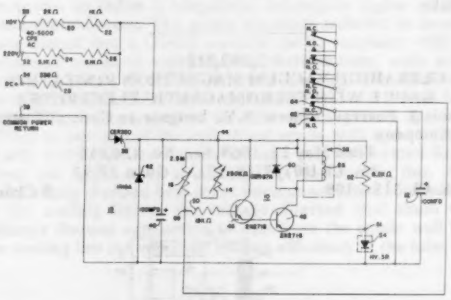
MULTIPLE-MODE SOLID-STATE TIME DELAY APPARATUS INCLUDING CHARGE-MONITORING TIMING CIRCUITS

Richard O. Traina, Randolph Township, N.J., assignor to Plessey Airborne Corporation, Hillside, N.J.

Division of Ser. No. 607,354, Dec. 21, 1966, Pat. No. 3,441,810, Apr. 29, 1969, continuation-in-part of Ser. No. 427,035, Jan. 21, 1965 and this application Jan. 21. 1969, Ser. No. 792,576

Int. Cl. H01h *47/18*; **I01h** *47/32*

U.S. Cl. 317—131 **7 Claims**



Multiple-mode solid-state time delay circuits in which the charge on a capacitor is monitored by a high-input-impedance temperature-stabilized amplifier or by a semiconductor switch, to actuate a relay. The relay may be locked electrically by establishing an amplifier-operating bias or may be a mechanical latching type with set and reset coils. In one embodiment a unijunction transistor alternately monitors the charge stored upon a pair of condensers and triggers an SCR to supply alternate set and reset pulses. The relay controls its connection to the SCR, discharges the condensers, and provides output switching. A regulated power supply accommodates diverse power sources.

3,582,716

APPARATUS FOR PROVIDING TIME DELAY UPON TOTAL DEENERGIZATION

Richard O. Traina, Randolph Township, N.J., assignor to Plessey Airborne Corporation, Hillside, N.J.

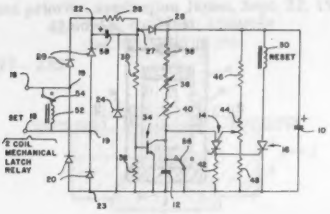
Filed Aug. 8, 1968, Ser. No. 751,316

Int. Cl. H01h *47/18*

U.S. Cl. 317—142 **14 Claims**

Solid-state apparatus for providing an output at the end of a predetermined delay interval commencing with total

deenergization of the apparatus. A main capacitor is charged from the power supply during energization of the apparatus, and a timing capacitor, which is prevented from charging during energization of the apparatus, is charged from the main capacitor upon total deenergization. A silicon-con-



trolled switch senses the charge buildup upon the timing capacitor and becomes conductive when the charge reaches a predetermined level, thereby discharging the main capacitor through an SCR and producing an output from a latching relay, which may be a two-coil mechanically latching type or a singlercoil magnetically latching type.

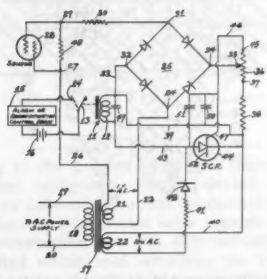
ERRATUM

For Class 317—178.5 see:
Patent No. 3,582,734

3,582,717
HUMIDITY-RESPONSIVE CIRCUIT

Leopold Perlaky, Lanham, Md., assignor to Hygrodynamics, Inc., Silver Spring, Md.

Filed July 29, 1968, Ser. No. 748,395
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5B **3 Claims**

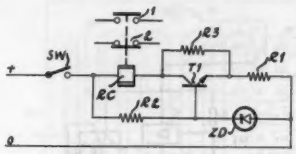


A humidity-responsive circuit consisting of a humidity-sensing element and a power supply winding in series connected through a rectifier bridge to a relay controlling an alarm or a dehumidification control device, the relay being connected in parallel with a normally nonconducting silicon controlled rectifier. The gate electrode of the silicon controlled rectifier is energized from an adjustable network arranged to trigger the silicon controlled rectifier at a preset level of conduction of the humidity-sensing element. This shunts the relay, allowing its contacts to close, thereby energizing the alarm or dehumidification control device. Any defect causing the relay to become deenergized will thereby cause its contacts to close, providing "fail-safe" operation.

3,582,718
CIRCUIT FOR IMPROVING RELAY PERFORMANCE WITH CURRENT LIMITING

Gordon Barr Spellman, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 18, 1969, Ser. No. 817,303
Int. Cl. H01h *47/32*; **G05f** *1/40*
U.S. Cl. 317—148.5 **10 Claims**

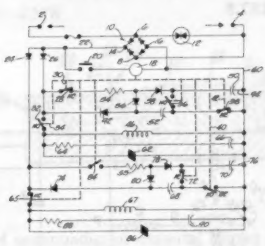


A transistor circuit for controlling energization of a DC relay coil forms a low impedance path through the transistor upon initial application of voltage and allows a fast coil current rise that increases the operating speed of the electromagnetic relay under a broad range of temperature conditions without exceeding coil current limitations. As the current increases to a predetermined value, the transistor control circuit is operated to provide a current limit action. The circuit is also designed so that it will continue to allow relay operation, although with an increased operating time, provided there is minimum required pickup voltage, in the event any one of the components fails.

3,582,719
FORCING CIRCUIT FOR INDUCTORS

Leo L. Stuckens, Milwaukee, Wis., assignor to Stearns Electric Corporation, Milwaukee, Wis.

Filed June 23, 1969, Ser. No. 835,408
Int. Cl. H01h *47/22*; **H07m** *3/18*
U.S. Cl. 317—151 **4 Claims**

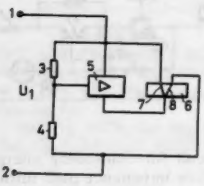


For developing forcing current in a circuit in which prompt electrical response in inductive loads is desirable, a plurality of capacitances are charged in parallel at the working voltage of the source. When forcing voltage is required, the capacitances are disconnected from their parallel charging lines and connected in series for forcing purposes to supply the resulting high voltage into the circuit which exhibits the inductive property of opposing change in current. When two such circuits are to be forced in alternation, means is provided for dissipating the energy in one circuit concurrently with delivery of forcing voltage into the other. Versatility is enhanced by connecting the respective coils to separate sockets into which various capacitances, potentiometers and/or suppression units are interchangeably plugged.

3,582,720
BRIDGE CIRCUIT

Konstantin Apel, Lehrenweg, Germany, assignor to Firma Holzer Patent AG

Filed June 23, 1969, Ser. No. 835,692
Claims priority, application Germany, June 21, 1968, P 17 63 547.1
Int. Cl. H01h 47/36
U.S. Cl. 317—153 3 Claims

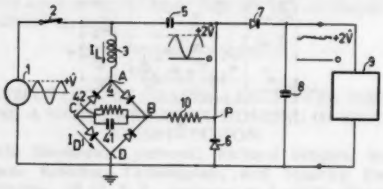


A bridge circuit for controlling a relay as a function of measured value, and wherein there is provided a device that functions with only one current supply and with which it is possible to eliminate the need of high resistivity circuit elements.

3,582,721
DEMAGNETIZING CIRCUIT ARRANGEMENT WITH DC VOLTAGE MEANS TO REDUCE CURRENT THROUGH THE DEMAGNETIZING COIL TO ZERO

Louis van Hoorn; Peter Johannes Hubertus Janssen, and Jan Lolke de Vries, all of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1969, Ser. No. 801,338
Claims priority, application Netherlands, Mar. 2, 1968, 68030/2
Int. Cl. H01h 47/00; H01f 13/00
U.S. Cl. 317—157.5 18 Claims

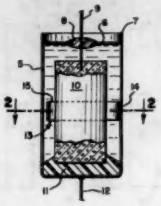


A demagnetizing circuit arrangement to be supplied by an AC voltage source and suitable for rapidly repeated demagnetization, including a demagnetizing coil in series with a full-wave rectifier circuit. For obtaining, after switching on the demagnetizing circuit arrangement, a demagnetizing current having an amplitude decreasing to the zero value without the current being interrupted by an additional switch the circuit arrangement according to the invention is provided with a DC voltage source formed, for example, as a rectifier circuit, the increasing maximum voltage of which causes the full-wave rectifier circuit to interrupt the demagnetizing current.

3,582,722
EXPLOSION-PROOF ELECTROLYTIC CAPACITOR

Raymond Neil Dalton, Boyertown, Pa., assignor to Kawecki Berylco Industries, Inc., New York, N.Y.

Filed July 29, 1969, Ser. No. 845,791
Int. Cl. H01g 9/06
U.S. Cl. 317—230 2 Claims

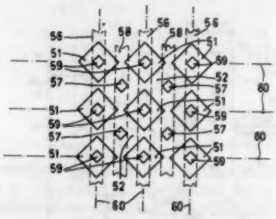


An electrolytic capacitor comprising an outer metal case within which a porous anode and a liquid electrolyte are hermetically sealed is made explosion proof by providing it with a self-shorting contact arm secured to one point on the inner surface of the case and at least partially surrounding, but one of contact with, the anode so that pressure generated within the case sufficient to cause bulging of the case will bring the case-carrying contact arm into electrical contact with the anode.

3,582,723
TRANSISTOR

George Kerr, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 11, 1968, Ser. No. 759,166
Claims priority, application Netherlands, Sept. 15, 1967, 6,712,617
Int. Cl. H01l 19/00, 9/12
U.S. Cl. 317—235 3 Claims



A high-power transistor in which the emitter is in the form of a grid adjoining a surface of a semiconductor body having collector and base regions, the latter surrounding the emitter. The apertures in the emitter grid form a plurality of juxtaposed rows with the base region.

The surface of the semiconductor body is covered with an insulating layer which covers the line of intersection of the emitter base junction with the surface. Base and emitter contacts are provided on the insulating layer forming an interdigital system.

Viewed along a row, the apertures in the emitter grid first have an increasing width and then a decreasing width. The apertures in a direction at right angles to the row correspond to digits of the base contact are arranged in rows.

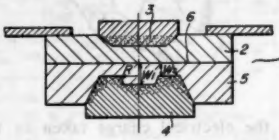
The insulating layer also comprises windows located substantially between four adjacent apertures through which the emitter contacts are connected to the emitter region.

3,582,724

TRANSISTOR HAVING CONCAVE COLLECTOR CONTACT AND METHOD OF MAKING SAME

Osamu Nakahara, Ota-shi; Kazuyoshi Goto; Masahiko Horiguchi, both of Ora-gun, Gumma-ken, and Tatsuya Ishihara, Ota-shi, all of, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi-shi, Japan and Tokyo Sanyo Electric Co., Ltd., Ora-gun, Gumma-ken, Japan

Filed Sept. 13, 1968, Ser. No. 759,650
Claims priority, application Japan, Sept. 22, 1967, 42/60956; 42/60958; 42/60959
Int. Cl. H01l 11/06
U.S. Cl. 317—235 9 Claims



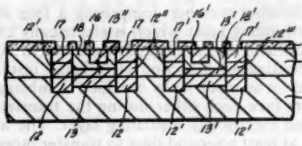
A switching transistor element of the concave collector contact structure and having excellent second breakdown characteristics and a method of making such a transistor by forming the concave collector contact by the alloying method using a jig comprising a projection, by the diffusion method which employs two kinds of impurities having different diffusion constants or by the epitaxial growth method using a substrate to which a concave part is provided in advance.

3,582,725

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND THE METHOD OF MANUFACTURING THE SAME

Yasuo Matukura; Sho Nakanuma, and Toshio Wada, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Aug. 21, 1969, Ser. No. 851,840
Int. Cl. H01l 5/00, 7/02
U.S. Cl. 317—235 11 Claims



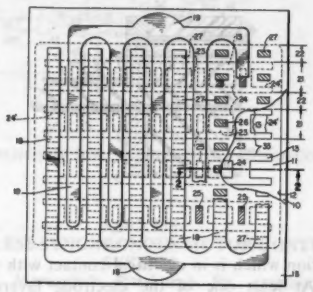
According to the present invention, there is provided a semiconductor integrated circuit device comprising a semiconductor substrate of a first conductivity type; two opposite conductivity type buried layer regions, both with high impurity concentration but with different outward diffusion speeds, formed within said substrate, the region with the faster speed surrounding the other; and epitaxial layer of the first conductivity type epitaxially grown over said substrate allowing the impurities of said buried layer regions to outwardly diffuse thereinto; a diffusion region of the second conductivity type formed by diffusing second conductivity type impurities from the surface of said epitaxial layer in alignment with the buried layer of the higher outward diffusion speed; and isolated region of the higher outward diffusion speed; an isolated region of the first conductivity type thereby simultaneously formed on the surface of the buried layer of lower outward diffusion speed and surrounded by the diffusion region; an isolation region comprised of part of the epitaxial layer also simultaneously formed on the substrate surrounding the diffusion regions, and finally, metal wiring film attached to each of the regions. The two regions of the buried layer may be formed by using different impurities or by using different concentrations of the same impurity.

3,582,726

HIGH FREQUENCY POWER TRANSISTOR HAVING A PLURALITY OF DISCRETE BASE AREAS

George J. Gilbert, Whitehouse Station, and Ronald Rosenzweig, Madison, both of, N.J., assignors to Microwave Semiconductor Corp., Somerset, N.J.

Filed Sept. 3, 1969, Ser. No. 854,964
Int. Cl. H01l 11/00, 15/00
U.S. Cl. 317—235 13 Claims



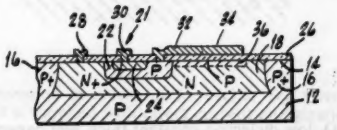
Emitter rows each having a plurality of discrete base areas spaced therealong alternate with rows of base material. Emitter contact areas extend through an insulating layer between discrete base areas. Base contact areas extend through the insulating layer to the discrete base areas and to spaced areas in the base rows, preferably in aligned columns. Advantageously the outer rows are base rows and opposite ends of the emitter rows are open ended.

3,582,727

HIGH VOLTAGE INTEGRATED CIRCUIT INCLUDING AN INVERSION CHANNEL

George Francis Granger, Kendall Park, and Heshmat Khajezadeh, Somerville, both of, N.J., assignors to RCA Corporation

Filed Sept. 17, 1969, Ser. No. 858,819
Int. Cl. H01l 11/00, 15/00
U.S. Cl. 317—235R 2 Claims



A body of semiconductor material has an isolation region of P-type conductivity which surrounds a plurality of zones of N-type conductivity. An insulating layer is disposed on the surface of the body. At least one of the N-type zones contains a region of P-type conductivity which is connected to a bonding pad on the surface of the insulating layer by means of an electrical lead. The electrical lead and the bonding pad are disposed on the insulating layer entirely within the area above the N-type zone containing the P-type region.

3,582,728

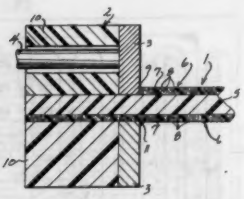
CAPACITANCE HUMIDITY SENSING ELEMENT

Paul E. Thoma, Burlington, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

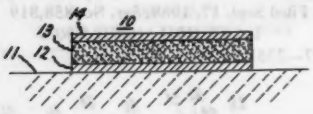
Filed Mar. 6, 1969, Ser. No. 804,792
Int. Cl. H01g 7/00; G01n 27/22
U.S. Cl. 317—246 15 Claims

A capacitance synthetic humidity sensing element comprising a moisture sensitive dielectric core and having electrode

layers integrally bonded to opposite surfaces of the core. Each electrode layer consists of a matrix of a dielectric, moisture-permeable material, and a plurality of interconnected electrically conductive particles are dispersed within the matrix. The element is supported within a central opening of a frame, and the frame includes an electrically conductive section which is in electrical contact with the electrode layers. At least one of the electrode layers is exposed completely to the environment being sensed. Changes in relative humidity provide changes in capacitance and this can be converted into a signal to indicate the relative humidity or to operate a humidity control system.



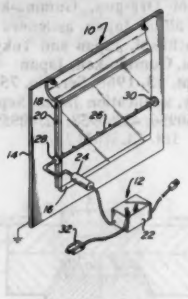
3,582,729
THICK FILM CAPACITORS AND METHOD OF FORMING
Roland T. Girard, Scotia, and George A. Rice, Schenectady, both of, N.Y., assignors to General Electric Company
Filed Oct. 1, 1969, Ser. No. 862,958
Int. Cl. H01g *3/06*
U.S. Cl. 317—258 **9 Claims**



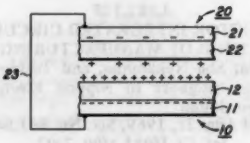
High Q, low dielectric constant thick film capacitors capable of being fired at a temperature below 875° C. are formed from a dielectric mixture of a metal oxide having a melting temperature between 750° C. and 875° C. and at least 30 percent by weight of a niobate, preferably of cadmium, bound together by a glassy binder forming less than 15 percent by weight of the dielectric mixture. When at least two parts by weight barium titanate (or modified barium titanate) are mixed with one part by weight dielectric mixture prior to screen printing, a capacitor is formed having a dielectric constant of approximately 275 and a Q above 250.

3,582,730
STATIC ELECTRICITY PINNING METHOD
Anthony Q. Testone, Lansdale, Pa., assignor to Testone Electrostatics Corporation, West Point, Pa.
Filed Jan. 2, 1968, Ser. No. 695,219
Int. Cl. B32b *31/28*
U.S. Cl. 317—262 **3 Claims**

Static electricity apparatus is provided including a device in the form of a wand coupled to a source of unidirectional potential for temporarily mounting a layer being worked onto a vertical or horizontal layer of high dielectric material. The layer being worked on is between a grounded substrate and the dielectric material. When the wand is moved over the layers, the layers are pinned together by static electricity. The substrate is of ground potential and provides a reference or basis for the electrical charge taken by the dielectric material.



3,582,731
CHARGING SYSTEM
Masamichi Sato; Yasuo Tamai, and Seiji Matsumoto, all of Saitama, Japan, assignors to Xerox Corporation, Rochester, N.Y.
Filed July 29, 1968, Ser. No. 748,518
Int. Cl. G03g *13/00*; **H05f**
U.S. Cl. 317—262 **18 Claims**

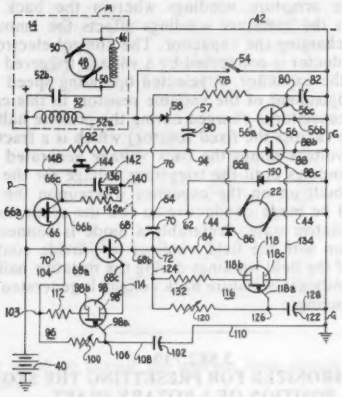


A charge bearing member comprising a free surface first electrically insulating layer which is electrically charged and which is backed by an electrically conductive substrate, is positioned, contiguous a second electrically insulating layer to be charged on an electrically conductive substrate. The insulating layers face each other during the transfer of charge to said second electrically insulating layer. The above steps are repeated at least a second time to transfer more charge to said second electrically insulating layer.

3,582,732
COORDINATED WINDSHIELD WASHER AND WIPER
Joseph F. Kovalsky, Buffalo, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.
Filed Nov. 17, 1969, Ser. No. 877,126
Int. Cl. H03k *17/62*
U.S. Cl. 318—102 **13 Claims**

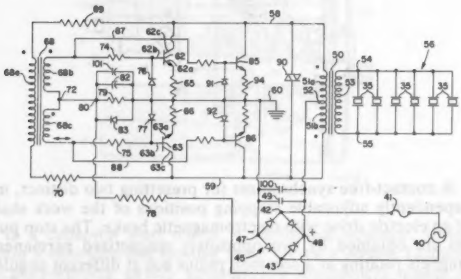
A control system for energizing a windshield washer pump and a windshield wiper motor simultaneously for conjoint operation and for sequentially discontinuing, first, operation of the washer pump and then operation of the washer motor includes a pair of silicon controlled rectifiers each in circuit with the washer pump and wiper motor respectively; a second silicon controlled rectifier is connected in a bypassing and extinguishing network in the circuit with each of the first mentioned silicon controlled rectifiers through a capacitor whereby triggering of each of the second pair of silicon controlled rectifiers extinguishes a corresponding one of the first pair of controlled rectifiers. In response to energizing the control system a first timing network is energized and after a time interval it transmits a voltage impulse to trigger the first one of the second pair of controlled rectifiers. Triggering of the first one of the second pair of controlled rectifiers initiates the start of a second timing circuit which, after a dura-

tion of time, triggers the second one of the controlled rectifiers in the extinguishing network to deenergize the



wiper motor. The timing networks are each switched by a unijunction transistor to start the timing period.

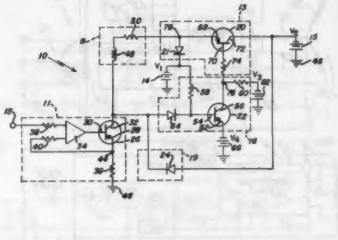
3,582,733
ULTRASONIC DISHWASHER
Robert D. Brubaker, Seven Hills, Ohio, assignor to The Tappan Company, Mansfield, Ohio
Filed May 20, 1968, Ser. No. 730,398
Int. Cl. H01v *7/00*
U.S. Cl. 318—116 **4 Claims**



Apparatus for supplying ultrasonic energy to a dishwasher consisting of a piezoelectric transducer arrangement associated with the washer chamber and a saturable core transformer, inverter-type circuit for energizing the transducers at high frequencies. Line voltage is utilized as the power source and "ripple voltage" provides variation in the inverter output frequency to prevent standing waves of ultrasonic energy in the washer chamber.

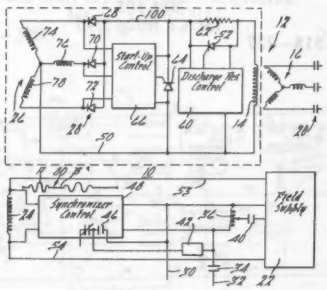
3,582,734
COIL DRIVER WITH HIGH VOLTAGE SWITCH
Joseph E. Bryden, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Apr. 24, 1969, Ser. No. 818,941
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 **6 Claims**

A coil driver circuit for ferrite phase shifters in a phased array antenna. The circuit provides for both slow and rapid changes between levels of coil current to effect changes in phase shift by means of a current-rate sensitive switch that momentarily applies a high-voltage to the coil when the current rate exceeds a particular value. This arrangement pro-



vides for a relatively low, average-power dissipation in the circuitry.

3,582,735
BRUSHLESS SYNCHRONOUS MOTOR CONTROL SYSTEM
Alexander P. Maruschak, Pittsburgh, Pa., assignor to The Ideal Electric and Manufacturing Company, Mansfield, Ohio
Filed Dec. 13, 1967, Ser. No. 690,293
Int. Cl. H02p *1/46*
U.S. Cl. 318—167 **29 Claims**

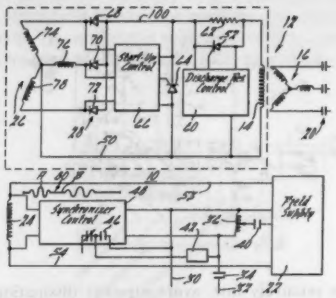


A synchronous brushless motor-exciter set wherein the motor field is supplied with direct current energization from the exciter armature, the exciter armature receiving electrical energy from the field supply electromagnetically from an exciter field. In the brushless set, the exciter armature and motor field are fixedly supported on the rotating member, and the exciter field and field supply are supported on a stationary member. A synchronous control circuit is mounted on a stationary member to provide control for the application of the field energy to the motor field winding at a preselected degree of slip operation of the synchronous motor.

3,582,736
BRUSHLESS SYNCHRONOUS MOTOR CONTROL SYSTEM
Carl E. Geib, Jr., Stockton, Calif., assignor to The Ideal Electric and Manufacturing Company, Mansfield, Ohio
Filed Dec. 13, 1967, Ser. No. 690,206
Int. Cl. H02p *5/28*
U.S. Cl. 318—176 **26 Claims**

A synchronous brushless motor-exciter set wherein the motor field is supplied with direct current energization from the exciter armature, the exciter armature receiving electrical energy from the field supply electromagnetically from an exciter field. In the brushless set, the exciter armature and motor field are fixedly supported on the rotating member, and the exciter field and field supply are supported on a sta-

tionary member. A synchronizer control circuit is mounted on a stationary member to provide control for the application



of the field energy to the motor field winding at a preselected degree of slip operation of the synchronous motor.

3,582,737

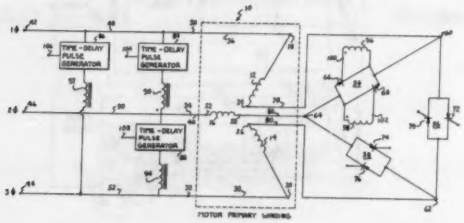
SPEED CONTROL OF A WYE-CONNECTED INDUCTION MOTOR UTILIZING DELTA CONNECTED TRIGGERABLE BICONDUCTIVE DEVICES

Herbert J. Brown, Scotia, and George M. Rosenberry, Jr., Schenectady, both of, N.Y., assignors to General Electric Company

Continuation of application Ser. No. 620,123, Mar. 2, 1967, now abandoned. This application Oct. 7, 1969, Ser. No. 866,103

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **3 Claims**



A variable speed polyphase induction motor system features phase-controlled thyristors connected in full-wave delta in the neutral of a wye-connected motor.

3,582,738

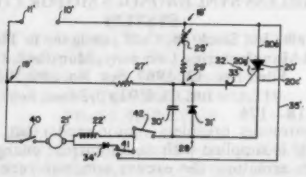
FEEDBACK SPEED CONTROL CIRCUIT FOR AN ELECTRIC MOTOR

Johannes G. A. Claassen, Eindhoven, Netherlands, assignor to Skil Corporation, Chicago, Ill.

Filed Oct. 24, 1968, Ser. No. 770,362

Int. Cl. H02p *5/16*

U.S. Cl. 318—249 **1 Claim**



A speed control circuit for a universal electric motor having series connected armature and field windings, wherein a controlled semiconductor, such as an SCR, is utilized. A circuit containing a fixed resistor and a variable resistor is connected to the supply voltage. The fixed resistor is connected in parallel with a capacitor and the armature windings forming a series circuit loop containing the fixed resistor, capacitor, and the armature windings wherein the back EMF generated in the armature windings affects the amount of voltage for charging the capacitor. The control electrode of the semiconductor is connected by a voltage triggered signal channel to the capacitor. A selected operating speed is obtained by adjustment of the variable resistor. In this control circuit the capacitor is charged during the positive half-cycle by a voltage (across the fixed resistor) which is a fraction of the supply voltage minus the back voltage generated in the armature windings until the triggering voltage for the signal channel is built up on the capacitor whereupon the signal channel will be made conductive to fire the semiconductor into a conductive state. Preferably a diode is connected in shunt relation with the field windings to provide controlled excitation of the field windings during the negative half-cycle so that a significant armature back voltage is generated in the armature windings.

3,582,739

SYNCHRONIZER FOR PRESETTING THE STOP POSITION OF A ROTARY SHAFT

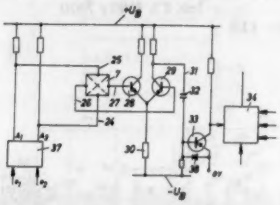
Heinz Daab, Darmstadt, and Karl-Heinz Meier, Darmstadt, Im Fluerchen, both of, Germany, assignors to Quick-Rotan Becker & Notz KG., Darmstadt, Germany

Filed July 3, 1969, Ser. No. 838,930

Claims priority, application Germany, July 9, 1968, P1763657.6

Int. Cl. H02p *3/04*

U.S. Cl. 318—275 **8 Claims**



A contact-free synchronizer for presetting two distinct, independently adjustable stopping positions of the work shaft of an electric drive with electromagnetic brake. The stop pulses are obtained by two oppositely magnetized permanent magnets rotating at a common radius but at different angular positions past a stationary Hall generator whose output is fed, via a differential amplifier and flip-flop, to the brake, so that only the signal of one magnet is utilized. To switch the brake to the signal of the other magnet, it is only necessary to reverse the potential of the Hall generator.

3,582,740

REVERSIBLE SPEED DC MOTOR CONTROLLER UTILIZING RESONANT FIELD REVERSAL

Owen E. Reinert, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

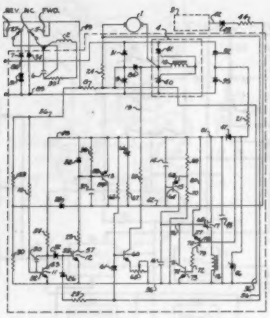
Filed Oct. 30, 1969, Ser. No. 872,536

Int. Cl. H02p *1/22*

U.S. Cl. 318—284 **5 Claims**

In a DC electric motor for which the current source is a rectified AC, a control circuit is provided whose function is to determine whether a current is present in the field of the motor. When such current is not present, the circuit prevents the firing of a silicon controlled rectifier supply circuit, thereby preventing abnormally high armature current during the period of reduced field current. The field circuit is modified by the addition of a capacitor in parallel with the motor field. The capacitor permits the easy interruption of

the field circuit by some means and limits the rate of change in the field as seen by the armature circuit to a level sufficiently small to permit the current limit circuit to become operative.

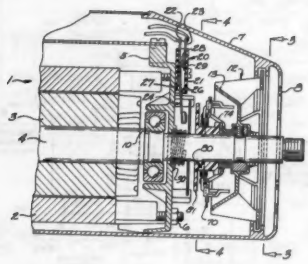


3,582,741

BRAKE SYSTEM FOR ELECTRICAL MOTORS

Harold D. Arnold, Bellefontaine Neighbors, and John G. Lewis, Saint Louis County, both of, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 28, 1969, Ser. No. 794,493
Int. Cl. H02p *3/18*
U.S. Cl. 318—209 **8 Claims**



In a capacitor start motor, a centrifugal actuator, acting upon a balanced but floating plate serves a double function of start-winding switch actuator and mechanical brake. A switching arrangement provides smooth dynamic braking until the mechanical brake is actuated.

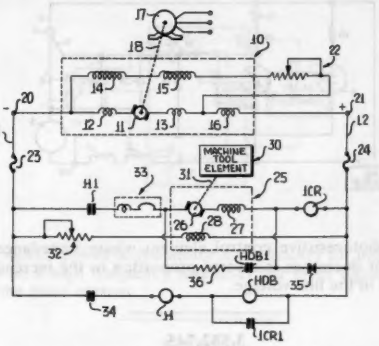
3,582,742

MACHINE TOOL SPEED CONTROL PROVISIONS

Samuel H. Martin, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.

Filed Apr. 10, 1968, Ser. No. 720,306
Int. Cl. H02p *5/04*
U.S. Cl. 318—302 **16 Claims**

A motor-generator combination for driving a machine tool element is disclosed herein. A generator supplies DC power to a DC machine tool element driving motor and speed control provisions are provided for a rapid reduction of motor speed such as causes regenerative current to be generated by the motor. A rectifier in series with the generator and motor armature prevents the application of regenerative current to the generator while establishing a voltage across such rectifier. A dynamic braking resistor is connectable in parallel with the motor armature to dissipate regenerative current and connection of the resistor across the motor armature is effected by control relays, one of which is connected across the rectifier for energization by the voltage occurring thereacross. Parallel connection of the braking resistor with the motor armature is broken upon a reduction in regenerative current and normal motor operation is resumed at a reduced speed.

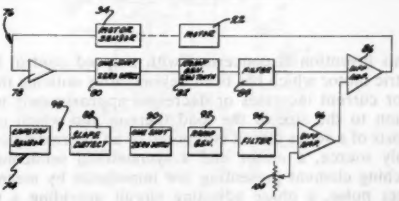


3,582,743

SPEED CONTROL SYSTEM FOR TAPE RECORDER APPARATUS

Guillermo Diaz; Robert E. Wood, Ann Arbor, and Samuel N. Irwin, Detroit, all of, Mich., assignors to Sycor Inc., Ann Arbor, Mich.

Filed Mar. 13, 1969, Ser. No. 806,932
Int. Cl. G11b *15/32*
U.S. Cl. 318—308 **7 Claims**



In a tape recorder/reproducer apparatus, particularly where a low-inertia highly responsive drive train is used, tape speed control means including a variable-speed motor for the drive train energized through a closed-loop servosystem in which the actual output speed of the motor is monitored by a sensor and compared to a reference, to closely control the motor speed in accordance with the reference. The reference is provided by a freely supported capstan which senses actual tape speed at the tape head and produces an output which is compared to a predetermined reference representative of the desired tape speed, such that the motor is servo controlled to satisfy a predetermined tape speed function.

ERRATUM

For Class 318—327 see:
Patent No. 3,582,699

3,582,744

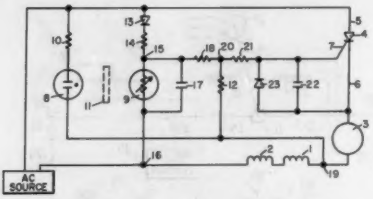
MOTOR SPEED CONTROL WITH PHOTORESISTIVE ELEMENT

Leo G. Coffey, Garland, and Luces M. Faulkenberry, Arlington, both of, Tex., assignors to Varo, Inc., Garland, Tex.

Filed Oct. 30, 1967, Ser. No. 679,149
Int. Cl. H02p *5/16*
U.S. Cl. 318—313 **6 Claims**

A control circuit for series wound DC and universal motors which compensates for line voltage variations, maintain-

ing constant power output from the motor even though the line voltage fluctuates over a wide range. A voltage regulator



with a photoresistive control element whose impedance increases or decreases in inverse proportion to the increase or decrease in the line voltage.

3,582,745

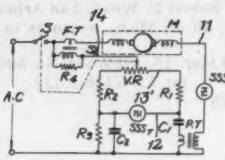
SPEED CONTROL CIRCUIT MOTOR

Yasukata Eguchi, and Kenji Kato, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1967, Ser. No. 684,909

Int. Cl. H02p *5/16*

U.S. Cl. 318—331 **3 Claims**



This invention is concerned with a speed control for an electric motor which has been devised after noticing that the motor current increases or decreases approximately in proportion to the size of the load thereon and which control consists of a series circuit composed of an alternating current supply source, a motor and a symmetrical semiconductor switching element presenting low impedance by means of a trigger pulse, a phase adjusting circuit providing a trigger pulse on this circuit, and an ignition circuit, and a primary winding of a feedback transformer connected in series between said current supply source and the motor, and a secondary winding connected between said phase adjusting circuit and the supply source, taking polarity into consideration, thus the motor current flowing through said switching element is impressed to said primary winding, and this current is transformed as voltage to this secondary winding, and a polarity of this transformed voltage is fed back as a voltage of a reversed polarity to the polarity of the voltage to be supplied to the phase adjusting circuit from the current supply source to sensitively respond to the fluctuation of the load so that the ignition phase of said switching element is controlled automatically.

3,582,746

MOTOR CONTROL SYSTEM WITH CURRENT LIMIT CIRCUIT

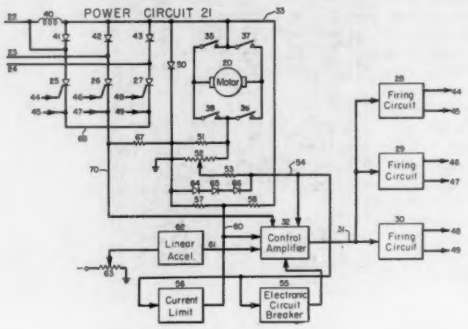
Dudley D. Nye, Jr., Fort Lauderdale, and Thomas Pantelakis, Margate, both of, Fla., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,458

Int. Cl. H02p *5/00*

U.S. Cl. 318—331 **8 Claims**

A DC motor control system is energized over semiconductor switches controlled by firing circuits coupled to a control amplifier stage. In turn, the control amplifier stage is regulated, in part, in accordance with a signal derived from a voltage divider circuit which provides a signal related to the motor terminal voltage. A current limit stage includes an operational amplifier circuit connected to receive an input signal related to the average motor armature current. The current limit stage also includes a constant current source



circuit for providing a substantially constant output current through at least a portion of the voltage divider circuit, to modify the motor terminal voltage signal which regulates the control amplifier stage.

3,582,747

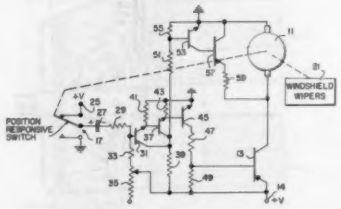
INTERMITTENT WINDSHIELD WIPER SYSTEM WITH ELECTRODYNAMIC BRAKING

Robert W. Kearns, 20524 Rutherford Ave., Detroit, Mich.

Filed May 23, 1968, Ser. No. 731,531

Int. Cl. H02p *7/28;* **B60s** *1/08*

U.S. Cl. 318—379 **18 Claims**



This specification discloses an intermittent automotive windshield wiper system in which windshield wipers are driven in repeating wiping cycles, stopping for a dwell period at the end of each wiping cycle. The windshield wipers are driven by an electric motor having a permanent magnet field and the wipers are electrodynamically braked to a stop at the end of each wiping cycle. An automatic switch is provided to, in effect, assure that the braking circuit is open at the end of each dwell period when the motor armature is again energized so that DC power is not applied to the braking circuit in parallel with the motor armature at the end of each dwell period.

3,582,748

ELECTRIC SEWING MACHINE WITH REMOTE HAND OPERATED CONTROL

Kenzi Kato, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1968, Ser. No. 703,475

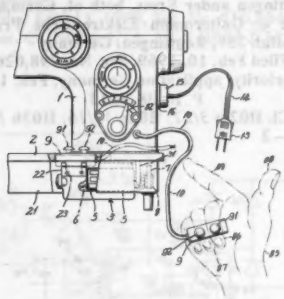
Claims priority, application Japan, Sept. 25, 1967, Mar. 27, 1967, Feb. 7, 1967, 42/4281331;42/4218606;42/429731

Int. Cl. H02p *5/16;* **H01h** *3/12*

U.S. Cl. 318—551 **3 Claims**

A variable resistor device for controlling the speed of an electric motor is installed in a case small enough to be put

into the operator's palm and a sliding element slidable on a variable resistor can be moved and set to any position as



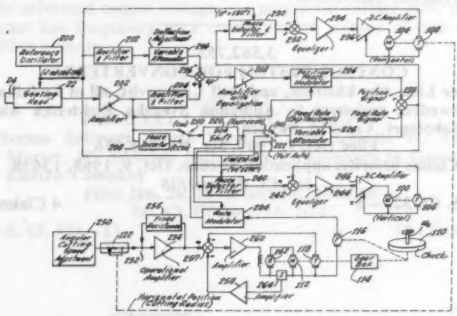
desired by a proper fingering operation of a pair of pushbuttons on said case.

3,582,749

CONTROL SYSTEM FOR POSITIONING A CUTTING TOOL IN AN AUTOMATIC TURNING MACHINE FOR AUTOMATICALLY POSITIONING AND CONTROLLING THE MOVEMENT OF THE CUTTING TOOL

Robert H. Wenzel, Orange, Calif., assignor to Textron, Inc., Covina, Calif.

Filed Oct. 1, 1968, Ser. No. 764,125
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 **11 Claims**



A tracer control system is provided for use in conjunction with turning machine tools, such as horizontal lathes or vertical turret lathes. The system of the invention provides an automatic control for the cutting tool of the machine along any desired two-dimensional path, as determined by the engagement of a sensing head stylus with the edge of a flat template. The control system to be described includes unique control circuitry which permits the turning speed of the machine to increase as the cutting tool is moved towards the center of rotation, and at the same time controls the rate of movement of the cutting tool tangent to the surface of the workpiece so that constant cutting speed may be achieved with a constant chip thickness as the cutting tool traverses the workpiece.

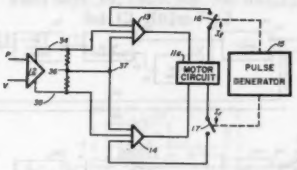
3,582,750

POWER DRIVER FOR REGULATING A SERVOMOTOR

Martin O. Halfhill, San Jose, Calif., assignor to Information Storage Systems, Inc., Cupertino, Calif.

Filed Mar. 21, 1969, Ser. No. 809,082
Int. Cl. G05b *11/28*
U.S. Cl. 318—599 **10 Claims**

The present invention relates to a power driver for supplying current to a servomotor, including circuitry for continuously monitoring drive current in the motor, a comparator for comparing the drive current in the motor with a position



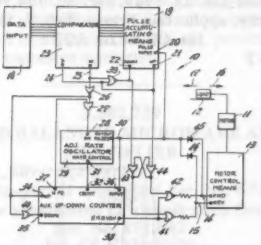
error signal applied to the motor and circuitry for pulsing the motor at a high frequency whenever the error signal differs from the drive current.

3,582,751

NUMERICALLY CONTROLLED ABSOLUTE MOTOR SYSTEM

Hermann Rosshirt, and Albert C. Leenhouts, both of Hartford, Conn., assignors to The Superior Electric Company, Bristol, Conn.

Filed Dec. 3, 1968, Ser. No. 780,735
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **8 Claims**



A numerically controlled motor system which accepts digital information of a desired position in absolute coordinates and supplies a train of pulses corresponding to the number of steps required of a stepping motor to eliminate the difference between the desired position and the previous position with the stepping motor moving a step for each pulse. The acceleration and deceleration of the motor at the ends of its movement are controlled by initially feeding all the pulses into a counter and having only a fraction of the pulses of the train being directed to step the motor. After completion of the train, the counter is uncounted with only a complementary fraction of each change of count producing a motor step. The cessation of the train of pulses provides a signal of an intermediate point in the total movement of the motor which enables control over acceleration and deceleration of the motor by the count in the counter.

3,582,752

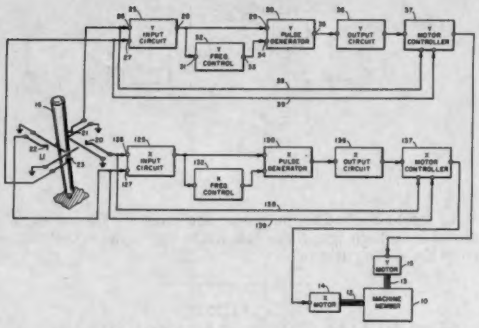
JOG CONTROL SYSTEM

Walter A. Steinberg, Huntington Station, N.Y., assignor to Autonumerics, Inc., Westbury, N.Y.

Filed Aug. 11, 1969, Ser. No. 849,124
Int. Cl. G05b *19/40*
U.S. Cl. 318—696 **10 Claims**

A motor control system for synchronous stepping motors which permits accurate control of a motor at slow speeds together with rapid slewing for large motor displacements.

The system includes a frequency control circuit comprising a field effect transistor for varying the rate at which a timing



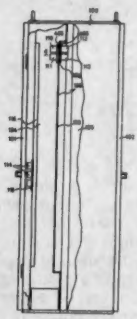
capacitor in a pulse generator is charged in response to an input displacement signal.

3,582,753

BUFFER CIRCUIT FOR DECOUPLING SYSTEM INTERFERENCE

Jean C. Lejon, Paris, and Michel L. Herjean, Les Clayes-Sous-Bois, both of, France, assignors to Controle Bailey Societe Anonyme

Filed Jan. 28, 1969, Ser. No. 794,702
Claims priority, application France, Feb. 7, 1968, 139,025
Int. Cl. H02m *3/22*
U.S. Cl. 321—2 **9 Claims**



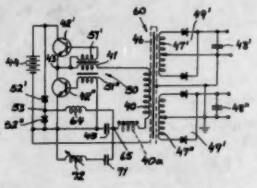
A transistorized input-output buffer magnetically coupled through a wall of a Faraday cage to isolate system components from field interference. The input buffer includes an oscillator circuit responsive to actuation of a process detector, a transformer having a primary winding connected to the oscillator output and a demodulator circuit within the cage having an input connected to the transformer secondary winding and an output connected to a digital processor. The output of the processor is connected to the output buffer which includes an oscillator circuit within the cage, a transformer having a primary winding connected to the oscillator output, and an amplifier connected to the transformer secondary winding for energizing actuators to control the process. The cores of the transformers for the input and output buffer circuits are positioned in an airgap formed in the wall of the Faraday cage in order to isolate the system components from electrostatic and electromagnetic interference.

3,582,754

DIRECT-CURRENT CONVERTER WITH OVERLOAD PROTECTION

Gunther Hoffmann, Einengen unter Achalm, and Heinz Baumann, Dettingen ander Erms, both of, Germany, assignors to Wandel u. Goltermann Elektronische Prazisionsmessgerate, Postfah 259, Reuttingen, Germany

Filed Feb. 10, 1969, Ser. No. 798,026
Claims priority, application Germany, Feb. 10, 1968, P 16 38 310.1
Int. Cl. H02m *3/22;* **H02p** *13/16;* **H03b** *11/00*
U.S. Cl. 321—2 **17 Claims**



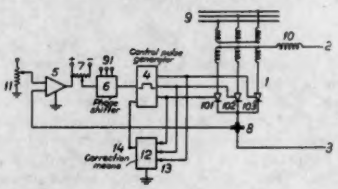
A pair of switching transistors, serially connected across a common DC source, have a junction returned to one of the source terminals through the primary of an output transformer in series with the primary of a control transformer and with a frequency-selective network which includes a blocking capacitor and discriminates against frequencies above a predetermined switching frequency established either by the network itself or by a tuned secondary circuit of the control transformer.

3,582,755

CONTROL SYSTEM FOR CONVERTERS

Gote Liss; Ake Ekstrom, and Rolf Ljungqvist, all of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 9, 1969, Ser. No. 865,056
Claims priority, application Sweden, Oct. 9, 1968, 13638
Int. Cl. H02m *1/08*
U.S. Cl. 321—5 **4 Claims**



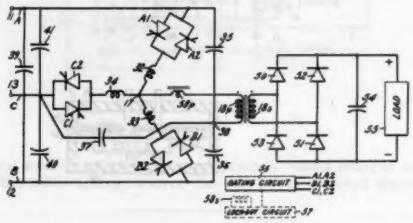
A static converter connecting an AC network with a DC line has a control system in which an AC control function voltage is derived from the AC network, while a DC regulator voltage is derived from a regulator. The control system further comprises a first arrangement for deriving the actual time between subsequent following control pulses for the valves of the converter and a second arrangement for deriving a desired value for said time corresponding to the relation between the period time of the AC network and number of pulses of the converter. The difference between said actual time and its desired value is stored in a memory circuit for each valve and as a correction magnitude taken together with the control function voltage and the regulator voltage.

3,582,756

POLYPHASE POWER CONVERTER CIRCUITS HAVING A HIGH FREQUENCY TRANSFORMER LINK

William McMurray, Schenectady, N.Y., assignor to General Electric Company

Filed Feb. 12, 1970, Ser. No. 010,804
Int. Cl. H02m 5/16, 1/14; H03d 3/18
U.S. Cl. 321—5 19 Claims



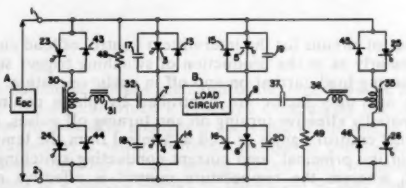
A polyphase switching circuit employing bidirectional conducting solid state devices (such as series capacitor commutated inverse-parallel connected SCRs) each in series with one winding of a single phase high frequency transformer are switched in sequence at a high switching rate as compared to the low frequency polyphase supply to time share the transformer link among the phases. On the secondary side of the transformer is a similar polyphase switching circuit or a single phase rectifier comprising switching devices in series with the other winding that are switched synchronously with those on the primary side. With the aid of output filter capacitance, the reformed output voltage is a polyphase voltage with the same low frequency or a unidirectional voltage of one or either polarity.

3,582,757

PARALLEL LATCHING INVERTER

Thomas Achinger, North Syracuse, and Charles W. Van Marter, W. Syracuse both of, N.Y., assignors to General Electric Company

Filed Jan. 26, 1970, Ser. No. 005,810
Int. Cl. H02m 1/18, 7/52
U.S. Cl. 321—11 10 Claims



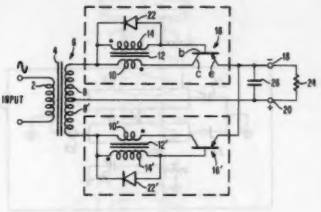
An inverter of controlled rectifier type in which switching transients across the rectifiers are minimized by commutation circuitry which accomplishes the load voltage switching and also provides full feedback of the commutation energy. The inverter comprises series-connected main controlled rectifiers each paralleled by a commutating circuit including a commutating controlled rectifier, an inductor and capacitance means, in a circuit arrangement such that the cyclical charge and discharge of the capacitance means commutates one of the main controlled rectifiers for the end of each load voltage half-cycle and switches the load voltage preparatory to the start of the next.

3,582,758

RECTIFIER USING LOW SATURATION VOLTAGE TRANSISTORS

John B. Gunn, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,213
Int. Cl. H02m 7/12
U.S. Cl. 321—47 4 Claims



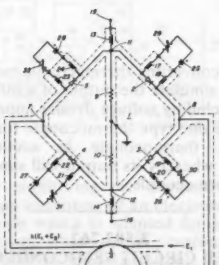
A circuit is employed utilizing the low collector-emitter voltage of a saturated transistor to obtain more efficient rectification of an alternating current supply than is achieved by a diode. A regenerative feedback circuit to the base of the transistor is provided so that once collector-to-emitter current is initiated, current is fed back to the base of the transistor to further drive the transistor into its conducting condition. However, since transistors may operate in a reverse direction when the load voltage is greater than that of the power supply, such regenerative feedback circuit is employed in series with the saturated transistor whereby any reverse collector current due to inverted operation causes the base of such transistor to be cut off, preventing any undesired reverse transistor operation.

3,582,759

SHIELDED BALANCED MICROWAVE ANALOG MULTIPLIER

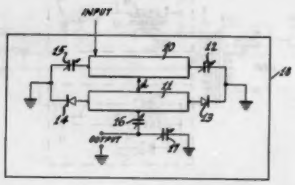
John H. Malloy, Silver Spring, Md.

Continuation-in-part of application Ser. No. 671,495, Sept. 28, 1967, now abandoned. This application Oct. 14, 1969, Ser. No. 871,442
Int. Cl. H02m 5/20
U.S. Cl. 321—69 6 Claims



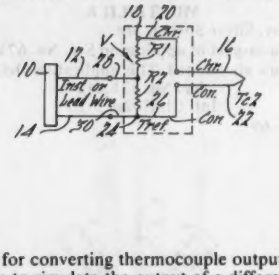
A completely shielded and balanced diode bridge, having biased diodes to insure dynamic balance and square-law operation, is fed by sum and difference signals from a hybrid ring drive which produces an output signal proportional to the product of the instantaneous amplitudes of the original microwave input signals applied to the hybrid ring drive.

3,582,760
FREQUENCY MULTIPLIER
Cheng Sun, East Brunswick, N.J., assignor to RCA Corporation
Continuation of application Ser. No. 645,915, June 14, 1967, now abandoned. This application Jan. 20, 1970, Ser. No. 4,331
Int. Cl. H02m *5/30, 5/20*
U.S. Cl. 321—69 **9 Claims**



A frequency multiplier which employs a pair of varactor diodes driven 180° out of phase in a particular transverse electromagnetic wave (TEM) transmission line arrangement in a manner to provide high-power, high-efficiency operation at frequencies above 1.0 gigahertz (GHz.).

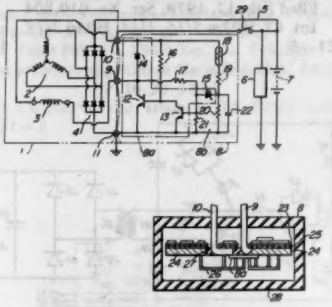
3,582,761
THERMOCOUPLE CONVERTOR
Berti F. Hall, Jr., 3568 Kipling Road, Berkley, Mich.
Filed Nov. 9, 1967, Ser. No. 681,738
Int. Cl. G01k *5/72*
U.S. Cl. 322—2 **13 Claims**



Apparatus for converting thermocouple output of one type thermocouple to simulate the output of a different type thermocouple and including voltage divider apparatus to be connected across the one type thermocouple for multiplying the output of that thermocouple in accordance with a preselected ratio whereby its output will simulate that of the different type thermocouple.

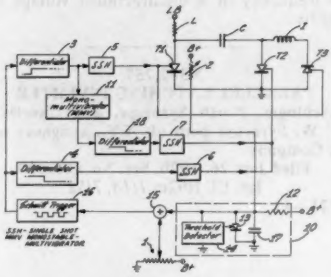
3,582,762
INTEGRATED CIRCUIT SEMICONDUCTOR-TYPE VOLTAGE REGULATOR AND CHARGING GENERATOR APPARATUS EQUIPPED WITH THE SAME
Kazumasa Mori, and Hisato Wakamatsu, both of Kariya-shi, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan
Filed Apr. 25, 1969, Ser. No. 819,382
Claims priority, application Japan, Apr. 27, 1968, Apr. 27, 1968, Aug. 13, 1968, Aug. 13, 1968, 43/28461;43/28462;43/57506
Int. Cl. H02p *9/30*
U.S. Cl. 322—28 **6 Claims**

A semiconductor-type voltage regulator principally constituted by semiconductors such as transistors, diodes, and the like without having any electrical contact, which is adapted to enhance the effect of radiation and to be small in size and is incorporated with a generator without lead wires



to thereby simplify the structure of a charging generator apparatus including said generator.

3,582,763
SEMICONDUCTOR CIRCUIT FOR TEMPERATURE INTERMITTENT OPERATION
Erich Huber, Sipplinger Str. 8, 8 Munich 60, Germany
Filed Dec. 11, 1968, Ser. No. 782,836
Claims priority, application Germany, Dec. 15, 1967, P1613891.3
Int. Cl. G05f *1/58*
U.S. Cl. 323—9 **20 Claims**

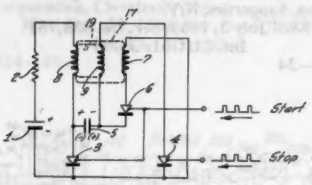


Control circuits for the intermittent control of load current particularly as to the production of switching trigger signals for turning load current on and off in cyclic operation. Duty cycle and duty factor are controlled by phase control of sequentially effective turning on and turning off pulses, using external control signals as well as control from the temperature of the principal, load current conducting switching element, wherein the temperature control is effective as an override in ranges close to a temperature of destruction of the element.

3,582,764
CIRCUIT FOR FORCING TURNOFF OF THYRISTOR
Erich Huber, Sipplinger Str. 8, 8Munich, 60, Germany
Filed Dec. 10, 1968, Ser. No. 782,634
Claims priority, application Germany, Dec. 13, 1967, P 16 38 862.
Int. Cl. G05f *1/56*
U.S. Cl. 323—20 **20 Claims**

A control circuit for extinguishing current flow in thyristors in which a capacitor discharges through a load current switching thyristor and compensates load current therein, and wherein the discharge current is augmented beyond the value available after an initial charge from the

power supply subsequent to a turn off of load current flow, by providing additional energy, for example, from the load

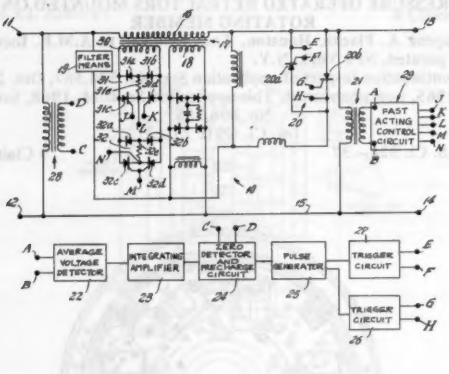


current and/or additional, appropriately timed sources other than the main voltage source directly but connected thereto.

3,582,765
AUTOMATIC VOLTAGE REGULATOR WITH FAST ACTING CIRCUIT

Owen J. McCabe, Bristol, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed June 16, 1969, Ser. No. 833,260
Int. Cl. G05f 1/30
U.S. Cl. 323—45 **6 Claims**



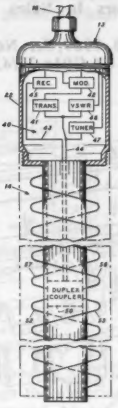
An automatic voltage regulator of the type having a buck-boost transformer which is rendered exceedingly fast acting to prevent excessive changes in the value of the output voltage caused by a sudden exterior change of condition. The regulator includes a fast acting circuit that immediately responds to a sudden change of the output voltage and acts to nullify the delayed reaction of the buck-boost transformer to adjust to the sudden change until the detector circuit for the transformer has responded to the changed condition and caused the value of output voltage to again be at its selected value under the control of the transformer.

3,582,766
PASSIVELY CONTROLLED DUPLEXER-COUPLER APPLIED TO A HELICAL ANTENNA FOR USE IN A BOREHOLE PENETRATING AN EARTH FORMATION

Keigo Iizuka, University of Toronto, University Ave. Queen's Park, Toronto 5, Ontario, Canada

Filed Nov. 13, 1969, Ser. No. 876,479
Int. Cl. G01v 3/12, 3/18
U.S. Cl. 324—6 **9 Claims**

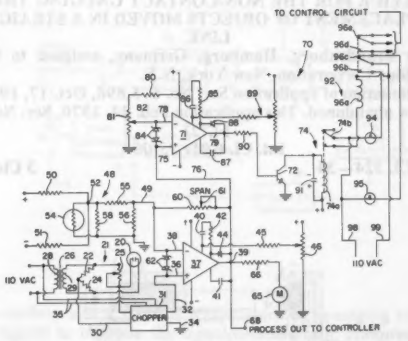
A passively controlled duplexer-coupler is applied to a helical antenna for use in a borehole penetrating an earth formation to produce cross-polarized transmitting and receiving characteristics.



3,582,767
APPARATUS HAVING AN INTEGRATED AMPLIFIERS FOR MONITORING THE CONDUCTIVITY OF SOLUTIONS

Thomas W. Brum, North Madison, and Frank D. Cochran, Mentor, both of, Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jan. 31, 1969, Ser. No. 795,597
Int. Cl. G01n 27/42
U.S. Cl. 324—30 **10 Claims**



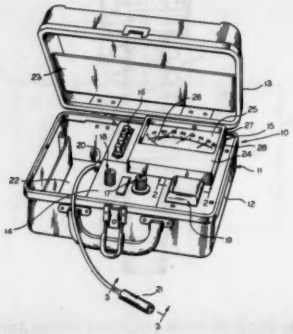
Apparatus for monitoring the conductivity of solutions over a broad range consisting of an electronic circuit including a test electrode which is adapted for immersion in the solution and through which an AC current is passed. The electrode forms part of a bridge circuit for developing an error voltage having a phase and amplitude related to the conductivity of the solution. A synchronous chopper converts the error voltage to an analog DC level for application to an integrated circuit operational amplifier. The amplifier receives as a second input a temperature compensated voltage and a variable feedback resistor connected between the output of the amplifier and the second input serves to vary the gain of the amplifier and adjust the span of conductivity readings. A volt meter is connected to the output of the amplifier to provide a continuous indication of conductivity levels and a further voltage sensing circuit compares the output voltage of the amplifier with a set point level to provide a visual indication of preset conductivity levels and a switching function for external control circuitry.

3,582,768

INDUSTRIAL WATER TESTING DEVICE

William R. Watson, Oaklawn, and James J. Moran, Matteson, both of, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed June 20, 1969, Ser. No. 834,981
Int. Cl. G01n 27/42
U.S. Cl. 324—30 3 Claims



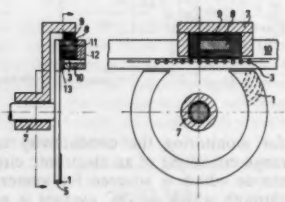
Device for testing industrial waters to determine optical density and/or electrical conductivity, wherein the device is portable and operable from a self contained power source or conventional line voltage to provide direct readings of optical density and electrical conductivity. Selector switches on the device, together with a meter having interchangeable faces, facilitate quick changeover for testing of different water conditions.

3,582,769

DEVICE FOR THE NON-CONTACT GAUGING THE DISPLACEMENT OF OBJECTS MOVED IN A STRAIGHT LINE

Klaus Brandenburg, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of application Ser. No. 675,898, Oct. 17, 1967, now abandoned. This application Feb. 24, 1970, Ser. No. 14,721
Int. Cl. G01r 33/00
U.S. Cl. 324—34 3 Claims



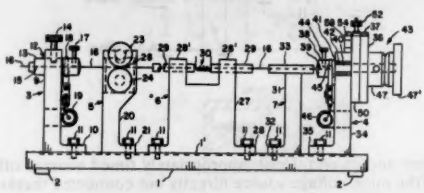
A device for noncontact gauging the linear displacement of an object includes a member having linearly spaced magnetic marks thereon whose centers lie along a straight line. A rotatable disc has uniformly spaced magnetic strips formed as involutes, the common evolute of which is a circle. The disc and member are relatively disposed such that the circle tangentially contacts a plane passing through the straight line connecting the centers of said marks. Measuring means is provided to determine the mark-strip-coincidence and thus provide a frequency signal with a phase related to a relative displacement.

3,582,770

DEVICE FOR MEASURING MAGNETOSTRICTION IN A PLATED WIRE WITH MEANS FOR ADJUSTABLY SETTING A PREDETERMINED STRESS IN THE WIRE

Donald L. Hammond, Saw Kill, N.Y., assignor to Ferroxcube Corporation, Saugerties, N.Y.

Filed July 3, 1969, Ser. No. 838,751
Int. Cl. G01r 33/00
U.S. Cl. 324—34 4 Claims



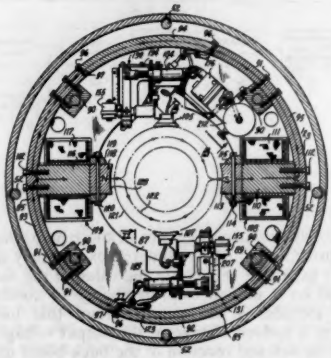
Stationary and rotatable chuck assemblies are mounted in a spaced apart relationship to each other and adapted to hold therebetween a plated wire specimen. A drive current is sent through the plated wire and a sensing coil is placed around the wire and will detect the magnetic induction and the changes thereof in response to movement of the rotatable chuck and attached plated wire.

3,582,771

MOVABLE INSPECTION DEVICE WITH FLUID PRESSURE OPERATED RETRACTORS MOUNTED ON A ROTATING MEMBER

Eugene A. Placke, Houston, Tex., assignor to A.M.F. Incorporated, New York, N.Y.

Continuation-in-part of application Ser. No. 504,567, Oct. 24, 1965, now abandoned. This application Sept. 11, 1968, Ser. No. 806,758
Int. Cl. G01r 33/12
U.S. Cl. 324—37 9 Claims



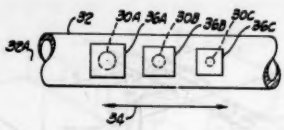
This application discloses apparatus for inspecting pipe or like tubular articles, particularly magnetic flux leakage-type inspection of ferromagnetic pipe. The pipe is moved axially through rotating inspection apparatus which includes a magnetizer having diametrically opposed pole pieces to produce rotating circumferential flux. Shoe assemblies bearing upon the pipe contain transducers responsive to flux leakage caused by flaws in the pipe, a fluid-powered arrangement being disclosed for suspending the shoes to provide retracted or engaged positions. For the fluid-powered shoe suspension assembly, unique drive mechanisms and lubricating techniques are shown. In one embodiment, the magnetizer pole pieces are adjustable to accommodate pipe of varying sizes.

3,582,772

METHOD OF CALIBRATING EDDY CURRENT FLAW DETECTION EQUIPMENT UTILIZING ATTACHABLE SLUGS TO SIMULATE FLAWS

Herman J. Hammer, Brooklyn, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Nov. 29, 1968, Ser. No. 779,731
Int. Cl. G01r 33/12
U.S. Cl. 324—40 10 Claims



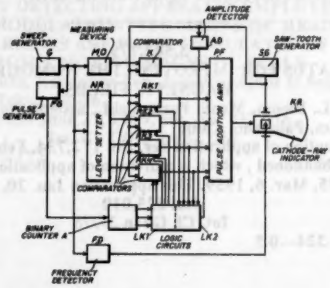
A method of calibrating eddy current flaw detection equipment comprises placing one or more metallic slugs in surface contact with a material of a type to be tested. The equipment is adjusted to respond to the presence of the slug or slugs producing electrical indications which are equated to defects of one or more levels of severity.

3,582,773

CIRCUIT ARRANGEMENT FOR REPRODUCING A TOLERANCE RANGE ON A CATHODE-RAY INDICATOR

Heniz Georg Karl, Ronninge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 30, 1968, Ser. No. 771,726
Claims priority, application Sweden, Nov. 17, 1967, 15803/67
Int. Cl. G01n 27/00
U.S. Cl. 324—57 4 Claims



A circuit arrangement provides for the generation of horizontal and vertical line segments related to voltage levels and frequencies, respectively, on a cathode-ray indicator to indicate the tolerance range of the transfer characteristic of a frequency sensitive measuring device. The device receives a sweep frequency signal from a sweep frequency generator. The sweep frequency generator in conjunction with a saw-tooth generator is used by circuitry which performs level comparisons at particular frequencies on the output signal of the measuring device to provide intensity modulating pulses that are fed to the cathode-ray indicator.

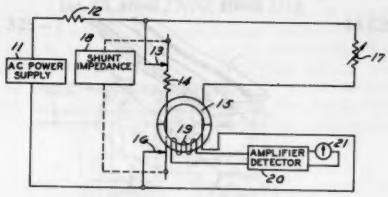
3,582,774

CIRCUIT IMPEDANCE MEASURING DEVICE EMPLOYING CLAMP ON MAGNETIC CURRENT SENSOR

Robert L. Forgacs, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 13, 1969, Ser. No. 807,783
Int. Cl. G01r 27/00, 27/26
U.S. Cl. 324—572 9 Claims

This disclosure relates to an electrical component impedance measuring device that is capable of measuring the impedance of an electrical component permanently connected in an electrical circuit. It comprises a source of electrical energy with means coupled to this source for connecting the electrical component in circuit with the source. A split-magnetic core having an opening position therein is supported by means that position a lead from the electrical component through this opening with the lead carrying current that flows only through the electrical component whose impedance is to be measured. Means are coupled to the core for sensing and measuring the flux in this core.

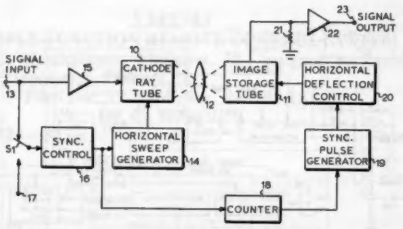


3,582,775

METHOD OF AND APPARATUS FOR FAST AVERAGING OF REPETITIVE SIGNALS WITH AN IMAGE STORAGE TUBE

Tom N. Cornsweet, Berkeley, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Jan. 24, 1969, Ser. No. 793,663
Int. Cl. G01r 23/16
U.S. Cl. 324—77 10 Claims



A method and apparatus is disclosed for averaging repetitive signals to increase the signal-to-noise ratio comprising a cathode-ray tube on which the signal is displayed as an intensity modulated horizontal line. The face of the cathode-ray tube is focused by a lens onto the photosensitive surface of an image storage tube, thereby causing the image tube to store a charge pattern that is proportional to the total amount of light that has fallen on it during a number (n) of horizontal sweep cycles of the cathode-ray tube. An electron beam inside the image tube scans the charge pattern every n-th cycle of the cathode-ray tube to produce a video signal that is proportional to the sum of all the signal-plus-noise events displayed on the cathode-ray tube since the last scan.

3,582,776

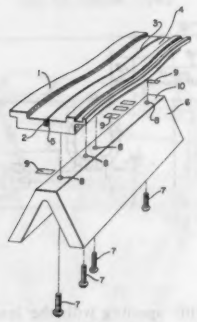
SLOTTED WAVEGUIDES

Andrew Alford, C/o Alford Manufacturing Co. 120 Cross St., Winchester, and Pasquale Barbagallo, Bedford, Mass.

Filed Oct. 21, 1968, Ser. No. 769,168
Int. Cl. G01r 21/00; H01p 1/00
U.S. Cl. 324—95 2 Claims

A slotted waveguide for high microwave frequencies has its

bottom shimmed at spaced points to straighten slight departures from straightness in the longitudinally extending hole.

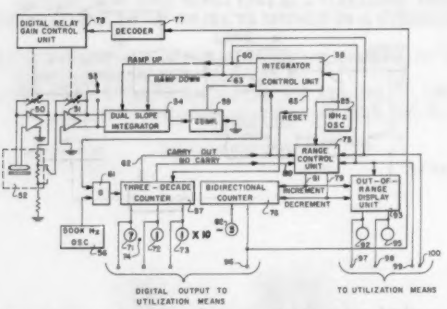


3,582,777

ELECTRONIC METERING SYSTEM

Irwin Wunderman, Mountain View, Calif., assignor to Physics International Company, San Leandro, Calif.

Filed July 5, 1968, Ser. No. 742,621
Int. Cl. G01r *5/22, 15/08*
U.S. Cl. 324—105 **30 Claims**



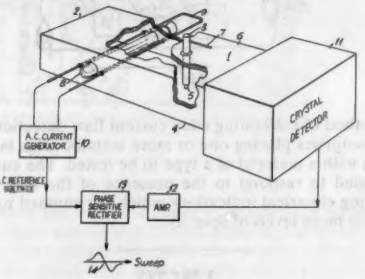
A quantum radiometer is provided for use with different photovoltaic cells in probes, each with a different wavelength filter. Temperature compensating, calibrating and scaling resistors mounted in a given probe comprise a voltage divider connected to the output of a low input impedance amplifier. The cell in the probe is connected directly to the input of the amplifier. A switch converts the arrangement of the resistors in the voltage divider to change the output from radiant power (watts) to photocurrent (optical amperes or photons/second). A digital display unit connected to the output of the voltage divider provides numerical display with a fixed radix point and a constant scaling factor. A variable exponent for the scaling factor is changed automatically as the gain of the amplifiers is altered to (1) provide in the display a nonzero digit in the most significant position and (2) prevent a carry out of the most significant digit position. Offset current may be introduced at the voltage divider, such as to introduce a conversion constant.

3,582,778

MICROWAVE MAGNETIC RESONANCE SPECTROMETERS INCORPORATING GUNN-EFFECT OSCILLATORS

Eric Andrew Faulkner, Reading, England, assignor to Brookdeal Electronics Limited, Bracknell, England

Filed Feb. 25, 1969, Ser. No. 801,966
Claims priority, application Great Britain, Mar. 20, 1968, May 7, 1968, 13453/68;21524/68
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **6 Claims**



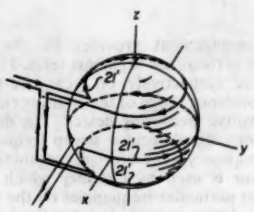
A microwave magnetic resonance spectrometer comprises a cavity in which a specimen is placed and which is energized from a Gunn diode. The cavity is subjected to a magnetic field having a steady component, an oscillatory component and a sweep component. Any electron spin resonance in a specimen absorbs microwave energy to alter the Q value of the cavity and this can be detected by a change in the amplitude of the microwave signal from the cavity.

3,582,779

APPARATUS FOR IMPROVING THE HOMOGENEITY OF MAGNETIC FIELDS

Arnold L. Bloom, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of application Ser. No. 172,734, Feb. 12, 1962, now abandoned , which is a division of application Ser. No. 797,775, Mar. 6, 1959. This application Jan. 20, 1966, Ser. No. 525,010
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **10 Claims**



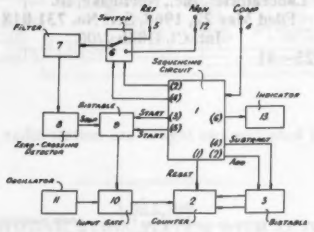
Coil configurations for improving the homogeneity of a certain volume of magnetic field by removing certain undesired second order magnetic field gradients including three spaced-apart current loops, each of the current loops being substantially coaxially disposed, a first of the current loops being disposed enveloping centrally the certain volume of magnetic field, the second and third current loops being bucking connected with respect to the first current loop and disposed straddling the certain volume of magnetic field, the second and third current loops have substantially equal turns, and the first current loop has approximately 0.7 times the turns of each of said second and third coils.

3,582,780

SYSTEM RESPONSIVE TO CHANGE OF PHASE BETWEEN TWO ELECTRICAL WAVES

Godfrey W. Hole, Avalon, New South Wales, Australia, assignor to Amalgamated Wireless (Australasia) Limited, Sydney, New South Wales, Australia

Filed Dec. 18, 1968, Ser. No. 784,593
Int. Cl. G01r 25/00
U.S. Cl. 324—83D 9 Claims



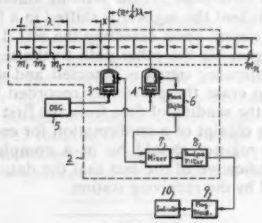
A phase measuring and monitoring circuit adapted to measure the phase difference between a reference signal and a monitored signal having a counter switchable to either an add or substract mode, the input to which is a sequence of measured pulses controlled by a filter and zero-crossing detector, the inputs of which are time-shared by the reference signal and the signal to be measured.

3,582,781

VELOCITY DETECTING APPARATUS EMPLOYING A PAIR OF MODULATION-TYPE MAGNETIC HEADS ON WHICH CARRIERS ARE PHASE MODULATED BY FLUX FROM A MOVING MAGNETIC SCALE

Saburo Uemura, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 27, 1969, Ser. No. 837,016
Int. Cl. G01p 3/48, 3/54
U.S. Cl. 324—172 2 Claims



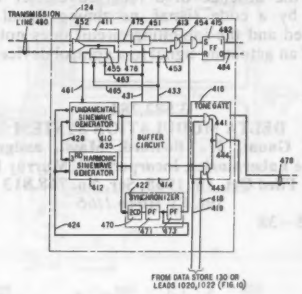
A velocity detecting apparatus comprises a movable magnetic scale and a pair of modulation-type magnetic heads adjacent the scale and spaced apart along the latter by a distance $(n+\frac{1}{4})$ times the wavelength of a sinusoidal magnetic signal recorded on the scale. Each head receives a sinusoidal carrier signal which is phase modulated in response to the magnetic flux received by the respective head from the moving scale, and the phase-modulated carriers, which are phase-shifted with respect to each other, are mixed to provide a composite phase-modulated signal received by a frequency discriminator to provide an output voltage proportional to the velocity of movement of the scale.

3,582,782

HARMONIC SINE WAVE DATA TRANSMISSION SYSTEM

Daniel Danielsen, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 24, 1968, Ser. No. 723,667
Int. Cl. H04l 27/10; H04b 7/16
U.S. Cl. 325—7 16 Claims



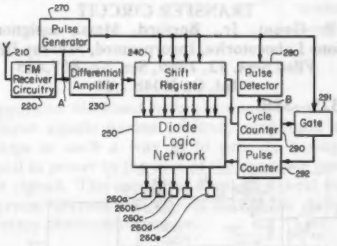
A data loop exchanges digital information in the form of sequential combinations of fundamental and third harmonic sine wave signals. The transmitted signal is formed by selectively gating the output signals from phase and frequency synchronized fundamental and third harmonic oscillators in signal periods between zero crossings of the fundamental signal. The received signals are amplitude detected at the midpoint of each signal period. The oscillators associated with one transmission circuit of the loop are synchronized to the oscillators of the other transmission circuit so that digital information may be simultaneously exchanged between the terminal devices of the loop.

3,582,783

MULTIPLE-FUNCTION REMOTE CONTROL SYSTEM

Melvin C. Hendrickson, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 19, 1968, Ser. No. 785,181
Int. Cl. H04q 9/00
U.S. Cl. 325—37 1 Claim



A multiple-function remote control system using digital logic for selectively actuating any desired one of a plurality of control devices respectively assigned to perform a corresponding plurality of control functions. The transmitter has an oscillator to generate a timing pulse signal. A diode logic system is responsive to the timing pulses to develop a plurality of digital signals, each signal consisting of a predetermined combination code group of the timing pulses and corresponding to one of the control functions. A manual switch is used to select a particular code group corresponding to the function the operator desires to control. A carrier-wave oscillator is frequency modulated by the selected code signal and the composite signal is transmitted to the receiver wherein the selected code signal is recovered. A diode logic system in the

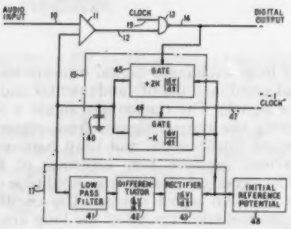
receiver deciphers the recovered code group and generates an appropriate actuating signal for application to the control device corresponding to the desired control function. To enhance the system's immunity to extraneous signals, an inhibiting circuit is provided comprising a timing signal generator in the receiver responsive to the received modulated carrier wave signal to reconstruct therefrom the timing signal generated in the transmitter. The reconstructed timing pulses are simultaneously applied to a detector and gating circuit to permit application of the actuating signal to the control device. In the absence of a received carrier wave signal modulated by a code signal, no timing signal pulses are reconstructed and the inhibiting circuit does not permit application of an actuating signal to a control device.

3,582,784

DELTA MODULATION SYSTEM

Wilmer B. Gaunt, Jr., Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 18, 1968, Ser. No. 768,813
Int. Cl. H04b *1/66*
U.S. Cl. 325—38 **2 Claims**



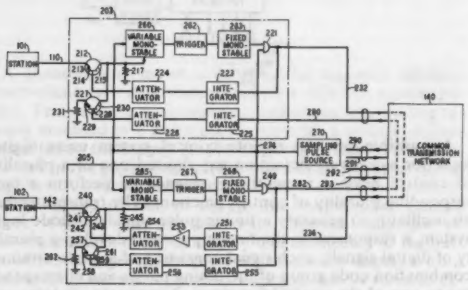
A delta modulation system is disclosed in which the input signal is compared with a reference level derived from the integrated output signal, the comparison resultant modulating a pulse train to produce the delta output signal in the conventional manner. The magnitude of the signal applied to the integrator is determined by the slope of the integrator output by applying the integral to a feedback loop including a differentiating circuit, the resultant derivative being gated to the integrator by the delta output signal.

3,582,785

HYBRIDLESS DELTA MODULATION SIGNAL TRANSFER CIRCUIT

Wilmer B. Gaunt, Jr., Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 12, 1969, Ser. No. 857,425
Int. Cl. H04b *1/00*
U.S. Cl. 325—38R **4 Claims**



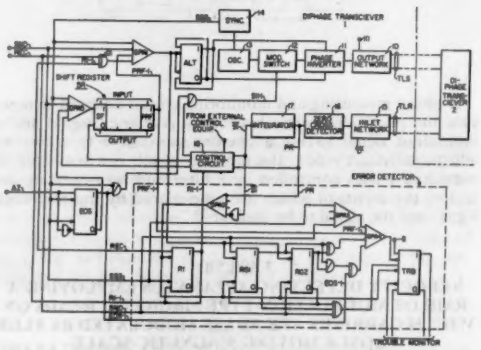
A signal transfer system using delta modulation to exchange signals between a plurality of stations is described in which a hybridless bilateral circuit is connected between each station and a common transmission path. The bilateral circuit includes a delta modulation coder comprising a pair of cascaded delay circuits and integrating network demodulators connected in a negative feedback arrangement. The negative feedback arrangement connected between a pair of selected bilateral circuits operates to exchange signals by minimizing the signal differences between the stations.

3,582,786

TRANSMISSION CHECK IN DATA SYSTEM

Lucas Bruglemans, Antwerp, Belgium, assignor to Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed May 22, 1968, Ser. No. 731,018
Int. Cl. H04b *1/00*
U.S. Cl. 325—41 **6 Claims**



A diphase signaling system wherein the signal equipment is arranged to send a confirming signal for every signal received and further having a small shift register connected to the sending and receiving equipment in such a way that it can be shifted in both directions. At the sending station, every time that a bit "1" is sent the register is shifted in a first direction. The receiving station upon detecting the bit "1" replies with an identical signal via the other path to the sending station, where this confirming signal is detected and applied to the shift register to erase the previously recorded bit. Upon the completion of the sending of data from the first to the second station and the receipt of a confirmation for each bit of data sent the shift register should be in a completely reset or empty state, indicative of the fact that the data sent was correctly received by the receiving station.

3,582,787

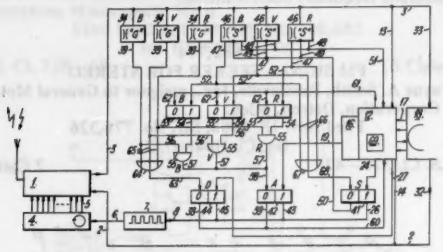
MOBIL RADIO TELEPHONE COMMUNICATIONS SYSTEMS

Jean Jacques Muller, Garches, and Michel Revel-Mouroz, Boulogne, both of, France, assignors to International Standard Elctric Corporation, New York, N.Y.

Filed Nov. 15, 1968, Ser. No. 776,196
Claims priority, application France, Nov. 17, 1967, 128688
Int. Cl. H04b *1/00*
U.S. Cl. 325—53 **5 Claims**

A mobile radio telephone system is supplied which employs a chain or network of land-based radio stations. Different groups of service and communications channels are used by adjacent ones of the land-based radio stations. The mobile stations incorporate means to search for and distin-

guish between the channels so that a particular group of service and communication channels associated with a given



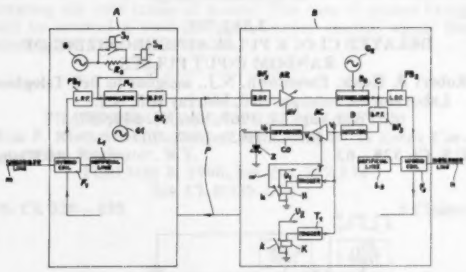
land-based radio station are sought out and used by the mobile.

3,582,788

TELECOMMUNICATION SYSTEM WITH AUTOMATIC VOLUME CONTROL

Francesco Castagna, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Apr. 29, 1968, Ser. No. 724,882
Claims priority, application Italy, May 2, 1967, 15618A
Int. Cl. H04b *1/00*
U.S. Cl. 325—62 **10 Claims**



Multichannel telephone system with transmission of pilot frequency to control the gain of an amplifier at a remote terminal by comparison of a reference voltage with a control voltage proportional to pilot amplitude, the pilot frequency being switchable between zero and a relatively low normal amplitude level for signaling in the absence of voice-frequency transmission and between this low level and an abnormally high level for signaling during such transmission; the changeover from normal to abnormal level triggers a compensating circuit which reduces the control voltage at the comparator input or increases the magnitude of the reference voltage to maintain the gain control independent of the pilot level.

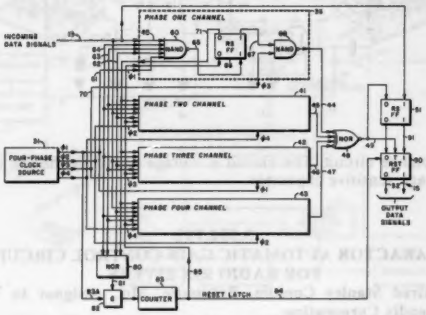
3,582,789

ASYNCHRONOUS DATA SIGNAL RECEPTION

John R. Mick, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 21, 1969, Ser. No. 792,494
Int. Cl. H04l *5/24*
U.S. Cl. 325—321 **5 Claims**

An incoming digital signal having a pulse repetitive frequency within a given range of frequencies is compared with multiple-phase clock signals, all within such given range of frequencies. In the receiver, a plurality of channels, one channel for each phase of the multiphase clock source, are jointly responsive to the incoming digital signal and to any one of the phases to actuate the channel to an active condition and simultaneously inhibit all other channels from being jointly responsive to such digital signal and respective clock phase. Upon completion of receipt of a predetermined number of digital signals, the receiver is reset to again permit any channel to be jointly responsive to an incoming digital signal and any clock phase for actuating a channel. Detection of incoming digital signals by a channel in an active condition includes comparing the incoming digital signal with a clock



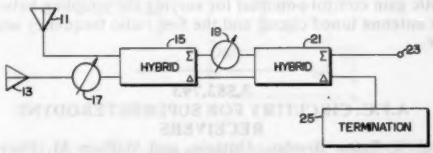
phase other than the clock phase used to activate the channel. Such other clock phase is selected on the basis of a change of signal state of the incoming digital signal. The resultant detected signal is then supplied to a data processing circuit.

3,582,790

HYBRID COUPLER RECEIVER FOR LOSSLESS SIGNAL COMBINATION

John P. Curtis, Reading, Mass., assignor to Adams-Russell Co., Inc., Waltham, Mass.

Filed June 3, 1969, Ser. No. 829,966
Int. Cl. H04b *1/06;* **H01p** *5/12*
U.S. Cl. 325—369 **1 Claim**



The apparatus disclosed herein is operative to combine a pair of input signals having arbitrary amplitude and phase relationships in such a way as to provide a single output signal equal in power to the sum of the available power of the two input signals. The apparatus employs hybrid couplers to obtain certain intermediate signals and phase shifters to obtain necessary phase relationships.

3,582,791

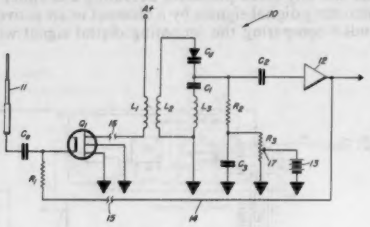
ANTENNA COUPLING AND TUNING CIRCUIT

Michael Slavin, Towson, and Peter Manson, St. Clair, both of, Md., assignors to The Bendix Corporation

Filed Dec. 11, 1968, Ser. No. 783,060
Int. Cl. H04b *1/18*
U.S. Cl. 325—381 **7 Claims**

A circuit for coupling an antenna to the input circuit of a radio receiver is described. The inventive circuit is particularly useful with the whip type of antenna ordinarily employed with mobile vehicles having AM and/or FM radio receivers. A field effect transistor is placed in the base of the antenna, and the signal received by the antenna is coupled to the input circuit through the FET. For this reason, changing the length of the antenna has no effect on the tuning of the

circuit. Coupling to the RF amplifier of the receiver is done by means of a unique coupling including a complex



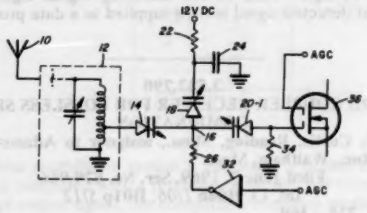
reactance circuit. The circuit is voltage tuned by the use of a voltage sensitive capacitor.

3,582,792

VARACTOR AUTOMATIC GAIN CONTROL CIRCUIT FOR RADIO RECEIVERS

Winfred Stanley Conklin, Baltimore, Md., assignor to The Bendix Corporation

Filed Dec. 23, 1968, Ser. No. 786,057
Int. Cl. H04b *1/18*
U.S. Cl. 325—411 **1 Claim**



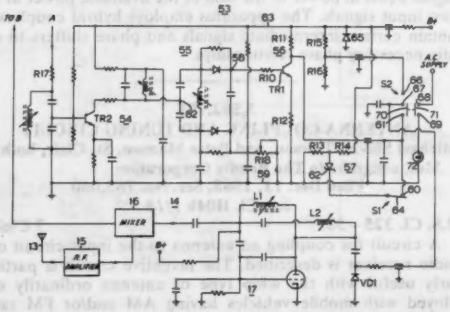
An automatic gain control circuit useful in radio receivers comprises a varactor means which is biased by receiver automatic gain control potential for varying the coupling between the antenna tuned circuit and the first radio frequency amplifier.

3,582,793

A.F.C. CIRCUITRY FOR SUPERHETERODYNE RECEIVERS

Paul V. Bates, Breslau, Ontario, and William M. Harrold, Kitchener, Ontario, both of, Canada, assignors to Electrohome Limited, Kitchener, Ontario, Canada

Filed Feb. 24, 1969, Ser. No. 801,616
Int. Cl. H04b *1/26*
U.S. Cl. 325—418 **24 Claims**



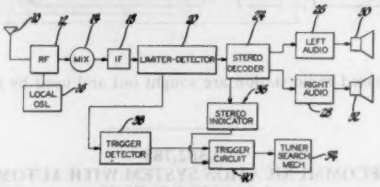
A superheterodyne signal receiver has coarse tuning means, fine tuning means and automatic frequency control means, the latter, when abled, being effective to automatically correct any mistuning of the local oscillator of the tuner of the receiver by the fine tuning means prior to abling of the automatic frequency control means.

3,582,794

FM SIGNAL SEEKER FOR STEREO

Wayne A. Smith, Russiaville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1968, Ser. No. 776,326
Int. Cl. H04b *1/32*
U.S. Cl. 325—471 **2 Claims**



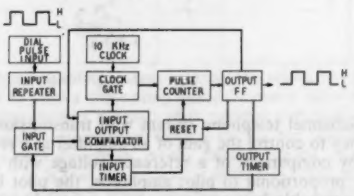
A circuit to permit an FM radio receiver equipped for stereo reception and having a search mechanism for scanning the FM band to respond only to stereo broadcasts. The detector signal and pilot signal are combined to operate a search latch mechanism only when both are present.

3,582,795

DELAYED CLOCK PULSE SYNCHRONIZING OF RANDOM INPUT PULSES

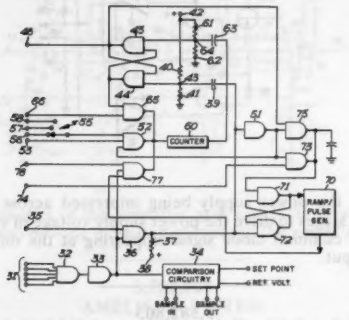
Robert B. Heick, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 14, 1969, Ser. No. 849,997
Int. Cl. H03k *1/00, 3/04*
U.S. Cl. 328—63 **10 Claims**



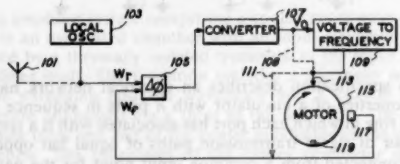
Each input pulse transition (low-to-high or high-to-low) gates 10KHz. clock pulses to a pulse counter. When the counter arrives at a count of 50 (5 milliseconds) it toggles an output flip-flop which (1) repeats the transition in synchronism with the clock but delayed 5 milliseconds and (2) resets the counter to zero. A clock gate permits the counter to accumulate clock pulse count when the input and output states are different and prevents the counter from accumulating clock pulse count when the input and output states are the same, thus taking into account fine chatter at the input transitions to extend the 5 millisecond time an amount depending upon the nature and extent of fine chatter. An analog input timer is energized whenever the input and output states are the same: the input timer will reset the counter after a prescribed energized time, thus to clear the counter of any partial count (less than an accumulation of 5 milliseconds) so as to disregard input pulse transitions existing with or without fine chatter for less than 5 milliseconds. An analog output timer is energized each time the output flip-flop repeats a low-to-high transition: the energized output timer bridges input pulse splits for 15 milliseconds by preventing input transitions from affecting the rest of the circuit for that length of time.

3,582,796
CONTROL SYSTEM
Glynne W. Shifflet, Jr.; Royal J. Dossett, and Gary D. White, all of Minneapolis, Minn., assignors to Electro/General Corporation, Minneapolis, Minn.
Filed Sept. 9, 1968, Ser. No. 758,482
Int. Cl. H03k 17/00
U.S. Cl. 328—69 10 Claims



In a control system utilizing comparison of a feedback signal with a set point voltage to develop an error signal, means for developing a train of pulses proportional to the error signal, means for developing a train of pulses proportional to the integral of the sign of the error, and means for summing the two trains of pulses. The sum of pulses being used to control a time-averaged output control signal for reducing the error signal to zero.

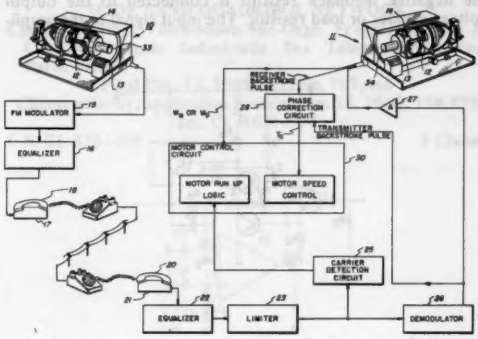
3,582,797
PHASE COMPARISON CONTROL SYSTEM
Alton F. Riethmeier, Rochester, N.Y., assignor to Zerox Corporation, Rochester, N.Y.
Filed May 8, 1968, Ser. No. 727,534
Int. Cl. H03b 3/04
U.S. Cl. 328—155 3 Claims



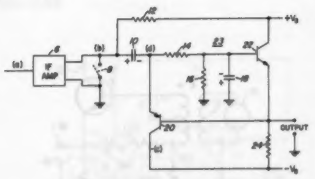
A phase comparison control system wherein the element to be controlled is a voltage controlled frequency source. A three stage counter is disclosed which is upcounted by a reference pulse train and downcounted by a feedback pulse train. When both frequencies are equal, the output is a square wave wherein the average value thereof is proportional to the phase difference of the two input frequencies. A digitally operated filter is used to generate the analog voltage for control of the frequency source.

3,582,798
ELECTRONIC PHASING SYSTEM
John R. Veale, London, England, assignor to Xerox Corporation, Rochester, N.Y.
Filed May 24, 1968, Ser. No. 731,857
Int. Cl. H03b 3/04
U.S. Cl. 328—155 7 Claims

A facsimile system employing electrical circuits to align rotating turrets in remotely located facsimile transceivers to a predetermined phase angle relation, wherein electrical signals indicating the angular position of said turrets are inspected to determine the phase angle between the turrets and a correction signal is generated and applied to the motor of one transceiver to alter its speed, thereby changing the phase angle between the turrets, said correction signal being sufficient to effect only a partial alignment of the turrets and being generated during successive sample periods until the turrets are aligned substantially to the predetermined phase angle relation.



3,582,799
DISCRIMINATOR CIRCUIT OF THE CHARGE TRANSFER TYPE
Terence Patrick Reid, Rochester, N.Y., assignor to General Dynamics Corporation
Filed Aug. 25, 1969, Ser. No. 863,003
Int. Cl. H03d 3/04
U.S. Cl. 329—103 9 Claims

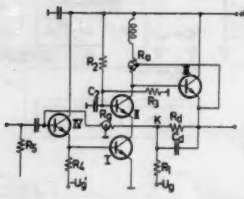


An FM signal discriminator circuit is described having a pair of emitter follower transistors of complementary symmetry cross coupled to each other. The output is taken at a base to emitter junction of one of the transistors so that voltage drops across the base to emitter junctions cancel, thereby enhancing linearity and temperature stability of the circuit. Discriminating action is obtained by transfer of charge between capacitors, one of which is contained in a charging circuit connected between the cross coupled transistors. The voltage across the last-mentioned capacitor is a function of the frequency of an input signal.

3,582,800
LOW-NOISE VIDEO AMPLIFIER
Klaus Lehmann, Darmstadt; Emil Siegel, Darmstadt-Arheilgen, and Manfred Kreuzer, Gross-Zimmern, all of, Germany, assignors to Fernseh GmbH, Darmstadt, Germany
Continuation of application Ser. No. 673,677, Oct. 4, 1967, now abandoned. This application Sept. 12, 1969, Ser. No. 857,602
Int. Cl. H03f 3/42, 1/34
U.S. Cl. 330—18 8 Claims

A video signal amplifier having a low noise-to-signal ratio. The amplifier has a cascade stage with a high impedance input stage for amplifying the signal applied to it. A load resistor in the form of a voltage divider is connected to the output of the amplifier, and the output signal appears across this

voltage divider. The voltage divider has a low ohmic branch which may be tapped off. A negative feedback resistor is connected across the low ohmic branch of the output voltage divider, and to the input stage of the amplifier. Through this arrangement the operating point of the input stage is exclusively established by the DC potential of the point at which the negative feedback resistor is connected to the output voltage divider or load resistor. The input signal to the amplifier may be capacitively coupled to the input stage. An impedance converter may also be connected to the amplifier output and to the cascade stage. An input resistor may be provided for applying the signal to be amplified to the input stage. The negative feedback resistor is of high impedance, of the order of 1 megohm. The amplifier is applicable as a video preamplifier for amplifying signals from television pickup tubes with high signal-to-noise ratio.

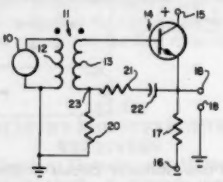


3,582,801

VOLTAGE AMPLIFYING CIRCUIT

David O. Hansen, Westminister, and Neal L. Roy, Redondo Beach, both of, assignors to TRW Inc., Redondo Beach, Calif.

Filed Apr. 10, 1969, Ser. No. 815,110
Int. Cl. H03f 1/38
U.S. Cl. 330—26 **7 Claims**



A circuit which includes a pulse transformer provides an amplified output voltage. A feedback loop utilizes a bootstrapping technique to establish a transformer secondary coil reference potential which is a function of the circuit output voltage. The amplified circuit output effectively increases a typical turns-ratio of 5 to an effective value of 50.

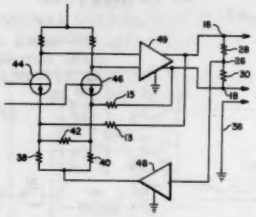
3,582,802

DIRECT COUPLED DIFFERENTIAL TRANSISTOR AMPLIFIER WITH IMPROVED COMMON MODE PERFORMANCE

Barret B. Weekes, Newport Beach, and William E. Shoemaker, Fullerton, both of, Calif., assignors to Beckman Instruments Inc.

Continuation of application Ser. No. 496,878, Oct. 18, 1965, now abandoned. This application July 16, 1969, Ser. No. 846,642
Int. Cl. H03f 1/38, 3/68
U.S. Cl. 330—30 **12 Claims**

A direct coupled multistage differential amplifier having high common mode rejection including means for deriving the common mode signal from the last differential stage and coupling such signal back to the first stage and at least one additional stage by way of a feedback path having a gain greater than one. The derived common mode signal is connected through the feedback path to at least one voltage point of the power supply being impressed across the differential stages to drive the power supply voltage in sympathy with the common mode signal appearing at the differential signal input.

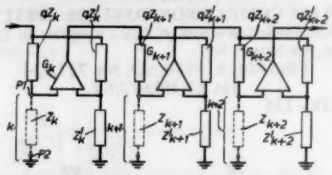


3,582,803

ELECTRICAL NETWORKS HAVING THE PROPERTIES OF CIRCULATORS

Philip Ernest Greenaway, Kenton, Harrow, and John Mortimer Rollet, Ealing, London, both of, England, assignors to Her Majesty's Postmaster General, London, England

Filed Mar. 10, 1969, Ser. No. 805,483
Claims priority, application Great Britain, Mar. 15, 1968, 12,766
Int. Cl. H03f 3/60
U.S. Cl. 330—53 **7 Claims**



This specification describes an electrical network having the properties of a circulator with n ports in sequence in a closed ring in which each port has associated with it a respective pair of signal transmission paths of equal but opposite gains connected from a common input point for the pair of paths to a common output point for the pair of paths, the port being coupled for signal transfer to and from only one of the paths of the pair, and the common output point for the pair of paths associated with each port being associated with the next port in the sequence so as to form a closed ring of pairs of paths. The transmission paths may consist of differential amplifiers respective to the pairs of paths together with associated resistors.

3,582,804

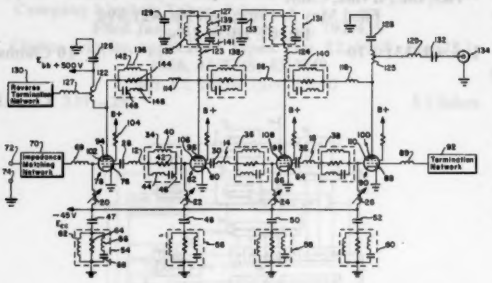
DISTRIBUTED AMPLIFIER DAMPING CIRCUITS

Alfred B. Beck, Torrance, Calif., assignor to T.R.W. Inc., Redondo Beach, Calif.

Filed Mar. 28, 1969, Ser. No. 811,299
Int. Cl. H03f 3/60
U.S. Cl. 330—54 **13 Claims**

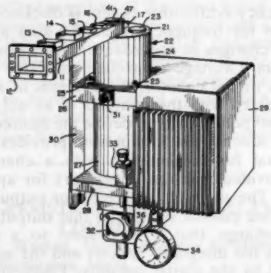
In a distributed amplifier adapted to amplify a bandwidth of signals having lower and upper band edge frequencies a parallel R-L-C circuit adapted for antiresonance at the upper band edge frequency is provided in series with at least one of the inductors in the series branches of the grid and plate transmission lines of the amplifier to provide stability to the amplifier. Additionally, another parallel R-L-C circuit

adapted for antiresonance at the lower band edge frequency is provided in series with at least one of the inductors in the



shunt branches of the amplifier grid and plate transmission lines to also provide increased stability to the amplifier.

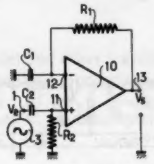
3,582,805
AMPLIFIER SYSTEM
Jans Kliphuis, 15 Hartman Hill Road, Huntington, N.Y.
Filed Aug. 4, 1969, Ser. No. 847,122
Int. Cl. H03f *3/60*
U.S. Cl. 330—56 **12 Claims**



An amplifier system comprising a cooled microwave amplifier in an evacuated chamber with an input waveguide connected by a thermally isolated transition to the input of the amplifier itself. The transition includes a thermally isolated probe extending into the waveguide and a coaxial choke structure connected via a filter to the amplifier. The probe extends from one end of the center conductor of the coaxial structure. The other end of the center conductor is connected to the center coaxial input terminal of the filter and is surrounded by a first coaxial sleeve, one end of which is connected to the outer coaxial terminal of the filter and the other end of which, adjacent the waveguide and the probe, is connected to one end of a second coaxial sleeve. The second sleeve extends back along the first sleeve about λ/4, where λ is the wavelength to which the amplifier is tuned. The two sleeves form a λ/4 transmission line, and the short at one end reflects as an open circuit at the other end of the second sleeve. Surrounding the second sleeve is a third tubular coaxial conductor, which may be a part of the mechanical support structure for the waveguide, and which is also approximately λ/4 long. The latter conductor is not conductively connected to the other conductor members but the infinite impedance at the end of the second sleeve and the outer conductor facing the amplifier is reflected as a short circuit λ/4 away, which is the equivalent of a short circuit between the latter end and the adjacent end of the first sleeve directly connected to the waveguide. An enclosure in the waveguide surrounds the probe in a gastight space that communicates with the evacuated chamber and is therefore itself evacuated.

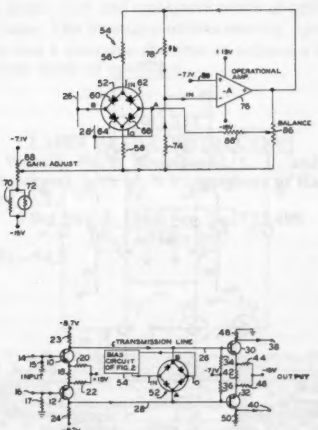
Within the chamber is a cooling unit to reduce the temperature of the amplifier. The cooling unit may be, for example, a Peltier effect device supported by a high thermal conductivity part of the chamber, or it may be a refrigerator, for example, a cryogenic device attached, thermally, to the amplifier to reduce the temperature of the amplifier to a few degrees Kelvin.

3,582,806
WIDE BAND QUADRIPOL NETWORK
Claude Le Dily, Villemoisson-Sur-Orge, France, assignor to C.I.T.-Compagnie Industrielle Des Telecommunications, Paris, France
Filed Dec. 12, 1968, Ser. No. 789,646
Claims priority, application France, Jan. 18, 1968, 136,579
Int. Cl. H03f *1/36*
U.S. Cl. 330—69 **5 Claims**



Quadripole capable of yielding a quadrature in a very wide band, or a phase displacement other than 90° in a fairly wide band, essentially comprising a differential amplifier connected to an RC integrator network mounted in the negative feedback loop, and an RC differentiator network mounted in the input circuit.

3,582,807
AMPLIFIER GAIN CONTROL CIRCUIT INCLUDING DIODE BRIDGE
John L. Addis, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed July 28, 1969, Ser. No. 845,471
Int. Cl. H03g *3/20*
U.S. Cl. 330—145 **9 Claims**



A gain control circuit for a DC coupled wide-band amplifier is described in which a diode bridge is employed to adjust the gain by providing a variable resistance between bridge outputs connected to such amplifier whose value changes with bias current flowing through such bridge. Bias current for the diode bridge is varied by changing the bias voltages applied to two bias resistors at inputs on opposite sides of such bridge, equally in opposite directions with respect to the quiescent DC voltage of the bridge outputs. This is achieved by an operational amplifier having an input connected to one side and its output connected to the other side of the bridge and a reference voltage on its other input equal to the DC

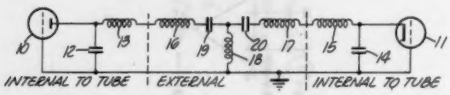
voltage on the bridge outputs to maintain the bias current in the two bias resistors equal. Two of the bridge diodes are of much larger junction area than the other two diodes to improve the linearity of the bridge resistance. A push-pull amplifier using the gain control diode bridge had a frequency response of DC to 630 megahertz and a rise time of 0.55 nanoseconds.

3,582,808

DOUBLE-TUNED CIRCUIT

Donovan C. Davis, Pasadena, Calif., assignor to Hoffman Electronics Corporation, El Monte, Calif.

Filed July 3, 1967, Ser. No. 650,769
Int. Cl. H03f 1/42; H03l 1/44
U.S. Cl. 330—178 **14 Claims**



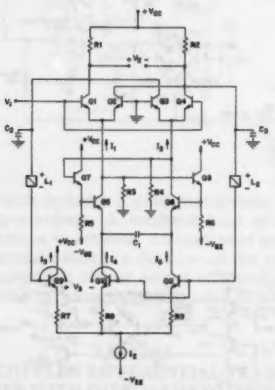
A double-tuned circuit in which a capacitor is connected to offset the effect of internal tube or transistor reactances and permit up to unity mutual coupling in an interstage circuit. In a preferred embodiment, a metallic cylinder positioned around the tube is used as the external cathode lead to lower its inductance.

3,582,809

PHASED LOCKED LOOP WITH VOLTAGE CONTROLLED OSCILLATOR

Graham Austin Rigby, Albany, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Sept. 6, 1968, Ser. No. 758,040
Int. Cl. H03b 3/04
U.S. Cl. 331—8 **9 Claims**



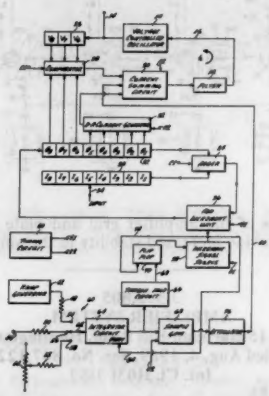
Phase locked loop having a voltage controlled oscillator, a phase comparator and filtering means all of which are integrated into a single monolithic block. The comparator is of The balanced bipolar analog multiplier type and is supplied a control voltage by a multivibrator of the voltage controlled oscillator. The collector load of the multivibrator is provided by the diode drops of the comparator's transistors. The multivibrator is driven by a differential current divider which in turn is provided current by a constant common current source.

3,582,810

FREQUENCY SYNTHESIZER SYSTEM

Garry C. Gillette, Mesa, Calif., assignor to Dana Laboratories, Inc., Irvine, Calif.

Filed May 5, 1969, Ser. No. 821,890
Int. Cl. H03b 3/04
U.S. Cl. 331—10 **10 Claims**



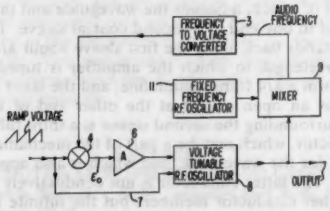
A frequency synthesizer system is disclosed utilizing phase registration for frequency regulation and affording smooth frequency changes in accordance with a control signal. The output from a voltage controlled oscillator is tallied (cyclically) by a digital counter, the contents of which is periodically compared with the contents of an accumulator that is incremented periodically to define the desired frequency, e.g. cycles per second. The comparison provides a primary regulation signal for combination with a change-commanding signal (provided from an integrator) for application to the oscillator. The slope of the integrator output is proportional to an applied control signal and that output is monitored to detect a change that is equivalent to a digital quantity, whereupon the integrator is reset and the accumulator is incremented by the digital quantity. Fractional quantities are also accommodated by the system.

3,582,811

CLOSED LOOP TRACKING OSCILLATOR

Floyd E. Kingston, Palo Alto, assignor to Varian Associates, Palo Alto, Calif.

Filed July 3, 1969, Ser. No. 838,765
Int. Cl. H03b 23/00
U.S. Cl. 331—10 **2 Claims**

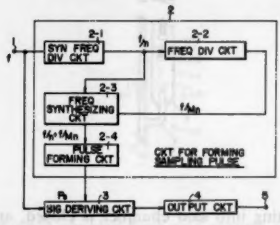


A closed loop tracking oscillator is disclosed. A voltage tunable oscillator causes its output frequency to track an input signal by converting a sampled portion of its output frequency to a voltage which varies in accordance with the output frequency. This voltage is compared with the input signal to be tracked to derive an error signal which is amplified and fed to the voltage tunable oscillator to be superimposed upon the input signal to reduce the tracking error toward zero.

3,582,812
FREQUENCY DIVIDING AND MULTIPLYING CIRCUITS USING A SAMPLING TECHNIQUE

Kiyoshi Kochi, Tokyo, Japan, assignor to Iwatsu Electric Company Limited, Tokyo, Japan

Filed Jan. 21, 1969, Ser. No. 792,439
Claims priority, application Japan, Jan. 22, 1968, Jan. 22, 1968, 43/3248; 43/3249
Int. Cl. H03b 3/04, 19/00
U.S. Cl. 331—25 5 Claims



In a frequency division circuit a sampling pulse occurring at a period of

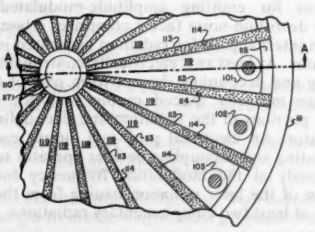
$$\frac{1}{\frac{f}{n}\left(\frac{M+1}{M}\right)}$$

is formed from an input signal of frequency f, the sampling pulse is used to effect sampling of the input signal to provide an output signal having a reduced frequency and a waveform similar to that of the input signal. To effect frequency step-up a signal of the reduced frequency produced by the frequency division circuit is compared with a stable reference frequency in a comparator to provide a control signal which is used to control a controlled oscillator such that the reduced frequency and the reference frequency coincide each other.

3,582,813
NEGATIVE-RESISTANCE MULTIPLE-ELEMENT COMBINER

Marion E. Hines, Weston, Mass., assignor to Microwave Associates, Inc., Burlington, Mass.

Filed June 19, 1969, Ser. No. 834,812
Int. Cl. H03b 7/14; H03f 3/10, 3/60
U.S. Cl. 331—56 11 Claims

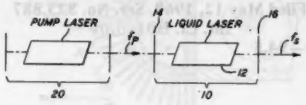


This invention relates to microwave networks in which radio frequency energy from a multiplicity of sources may be combined into a single transmission line when these sources are of the same frequency and have the same phase. A significant feature of the invention is that energy will be absorbed when the multiple sources have different frequencies or if they have different phases at the same frequency. A particular application of the network is a power combiner for an oscillator or power amplifier when multiple negative-resistance devices are needed, providing a means for avoiding or suppressing undesired oscillations which may occur at multiple frequencies or in nonsynchronous phase relationships.

3,582,814
TWO-PHOTON LIQUID LASER

Michael A. Duguay, Berkeley Heights, and Peter M. Rentzepis, Millington, both of, N.J. Bell Telephone Laboratories, Incorporated, Murray Hills, Berkeley Heights, N.J.

Filed Dec. 21, 1967, Ser. No. 692,573
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 4 Claims

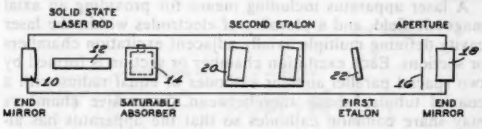


Lasing at ultraviolet and other wavelengths is achieved in a two-photon laser employing organic liquid mediums such as benzene solutions of 9, 10-dibromoanthracene, 9-methylanthracene and 9, 10-dimethylanthracene.

3,582,815
LASER LIGHT SOURCE

Larry D. Siebert, Ann Arbor, Mich., assignor to Conductron Corporation, Ann Arbor, Mich.

Continuation-in-part of application Ser. No. 690,620, Dec. 14, 1967. This application June 24, 1968, Ser. No. 739,227
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 12 Claims

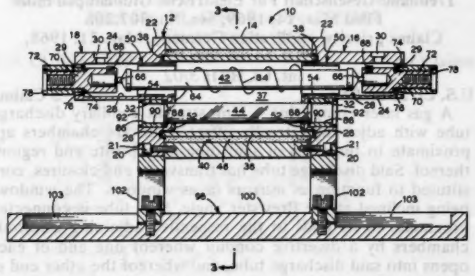


This invention relates to improvements in cavity configurations for a single axial and transverse mode of operation of a solid state laser. This invention utilizes mirrors, optical filters, an aperture and a saturable absorber to achieve a single axial and transverse mode of operation.

3,582,816
LASER HEAD CONSTRUCTION

Lawrence Waszak, North Massapequa, L. I., and Joseph J. Duffy, Northport, both of, N.Y., assignors to Hadron, Inc., Westbury, N.Y.

Filed Nov. 5, 1968, Ser. No. 773,499
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 17 Claims



A laser head construction including a plastic housing having a central member and end caps connected thereto. An inner housing having a hollow interior defining a cavity is

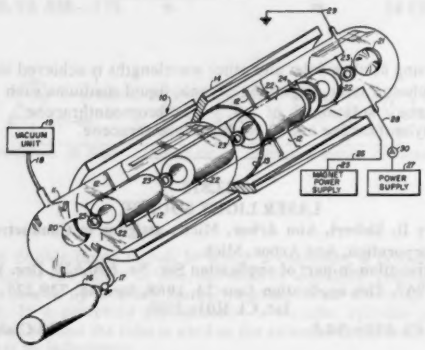
spaced from the outer housing by a reflective material. Within the cavity is a flash lamp and a laser. Electrodes are provided to initiate operation of the lamp and to shield the housing from rays emitted by the flash lamp.

3,582,817

GAS LASER HAVING EXCITATION CHAMBERS

Verle A. Gilson, Livermore, Calif. The United States of America as represented by the United States Atomic Energy Commission

Filed May 12, 1969, Ser. No. 823,887
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 **3 Claims**



A laser apparatus including means for providing an axial magnetic field, and a plurality of electrodes within the laser cavity defining multiple axially adjacent excitation chambers or sections. Each excitation chamber or section is formed by two spaced parallel annular cathodes of equal radius with a coaxial tubular anode therebetween. Successive chambers may share common cathodes so that the apparatus has alternately spaced cathodes and anodes. A potential difference applied between the anodes and cathodes causes electrons to make spiraling paths and undergo high frequency oscillations along axial magnetic field lines causing comparatively long electron lifetimes within each chamber, thereby increasing the probability of exciting particles contained therein. A high fraction of the gas particles contained in the laser cavity are excited to lasing levels by collisions between the electrons and the gas particles, thereby producing a high system efficiency which has a lower threshold current which thus allows for the use of smaller power supplies than for prior known lasers of comparable power output.

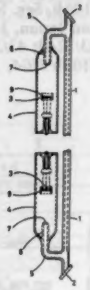
3,582,818

GAS LASER HAVING THE DISCHARGE TUBE CONNECTION TO THE CATHODE BY A CONDUIT WITH A CONSTRICTIVE ORIFICE

Joseph Rudolph, Augsburg, Germany, assignor to Patent-Treuhand-Gesellschaft Fur Elektrische-Gluhlampen mbH

Filed Mar. 14, 1969, Ser. No. 807,206
Claims priority, application Germany, Mar. 21, 1968, P 17 64 006.1
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **5 Claims**

A gas laser comprising a long straight capillary discharge tube with adjoining laterally offset electrode chambers approximate to the sides of said tube at opposite end regions thereof. Said discharge tube has transverse end closures, constituted to function as mirrors or as windows. The windows being inclined at the Brewster angle. Said tube is connected proximate to its ends to the respective adjoining electrode chambers by a divertive conduit whereof one end of each opens into said discharge tube, and whereof the other end of each conduit provides passageway connection to the respective electrode chamber. At least with respect to connection with the cathode chamber, said conduit extends coaxially for a distance thereinto and has an orifice opening into said chamber at a distance from place of entry of said conduit into the chamber. In one form of the physical embodiment of the invention, said orifice enters longitudinally of the end of the conduit, whereas in the preferred form the end of the



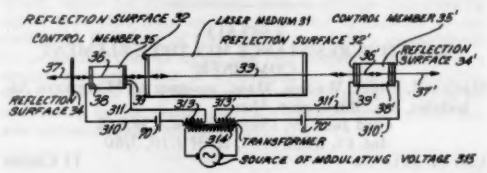
conduit projecting into said chamber is closed, and the orifice opens at the side thereof near to the closed end of the conduit.

3,582,819

DEVICE FOR INTERNAL MODULATION OF LASER RADIATION

Rudolf Muller, Strasslach near Munich, and Karl Gurs, Munich, both of, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Aug. 23, 1968, Ser. No. 816,423
Claims priority, application Germany, Apr. 11, 1963, Apr. 16, 1963, May 22, 1963, S-84,739;S-84,715;S-85,344
Int. Cl. H01s *3/00;* **H04b** *9/00*
U.S. Cl. 331—94.5 **11 Claims**



Apparatus for emitting amplitude-modulated radiation with a low distortion-noise factor comprises a laser resonator forming an internal path for radiation generated internally of the resonator. At least two electrically controllable radiation modulating and decoupling devices form part of the resonator and are mutually spaced in the path for modulating respective portions of the radiation and decoupling it out of the resonator. An electrical push-pull circuit connected to the modulating and decoupling devices operates such devices simultaneously at the modulating frequency for push-pull modulation of the laser radiation issuing from the resonator to provide at least two complementary radiations.

3,582,820

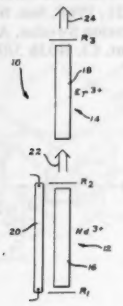
ERBIUM LASER DEVICE

Elias Snitzer, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 29, 1968, Ser. No. 724,854
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **9 Claims**

A laser device comprised of first and second laser cavities having a trivalent neodymium-doped laser rod positioned within said first laser cavity, and a trivalent ytterbium-trivalent erbium-doped laser rod within said second laser cavity. Coupled to said first cavity is a flash tube for producing a state of population inversion within said neodymium-doped rod and the resulting laser energy at 1.06 or 0.92 microns is directed into said ytterbium-erbium rod within

said second cavity to produce a state of population inversion within said erbium ions to produce laser energy at 1.5

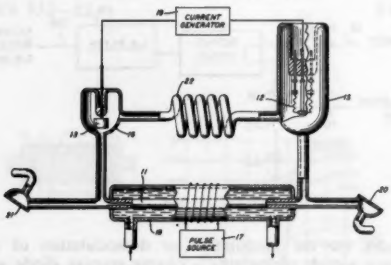


microns which is coupled from said second cavity to the exterior for utilization.

3,582,821
DIRECT CURRENT EXCITED ION LASER INCLUDING GAS RETURN PATH

Eugene I. Gordon, Convent Station, and Edward F. Labuda, Madison, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, New York, N.Y.

Filed July 27, 1964, Ser. No. 385,159
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **11 Claims**



1. An ion laser comprising:
a linear discharge tube;

said tube being filled with a quantity of gas which is capable of population inversion in an ionized condition;

means for establishing a substantially continuous gas discharge through said gas;

means for maintaining a sufficiently high current flow through said gas to ionize a significant proportion of said gas and to establish a population inversion of component ions;

enclosures attached to opposite ends of said discharge tube;

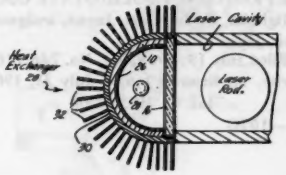
and means for equalizing the gas pressures along said discharge tube comprising an auxiliary tube interconnecting said enclosures.

3,582,822
LASER FLASH TUBE

James L. Karney, Oxnard, Calif.

Filed Nov. 21, 1968, Ser. No. 777,812
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 **1 Claim**

The present concept is directed to an improved laser pumping source, or flash tube, which is normally located adjacent a rod of lasing material within a cavity having a highly reflective inner surface. Since large amounts of heat are generated, the maximum operating temperature of the unit has been limited by the melting point of the materials which seal the various sections making up the enclosure. Disclosed

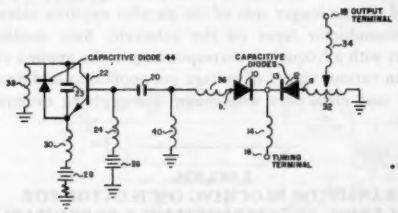


is a sealing technique whereby the maximum operating temperature may be raised as high as 800° C. In addition, the configuration of the cavity is modified so that a larger percentage of the energy emitted by the flash tube reaches the lasing material thus improving the overall efficiency of the assembly.

3,582,823
VOLTAGE CONTROLLED OSCILLATOR IN WHICH CAPACITIVE DIODES BECOME RESISTIVE DURING PORTIONS OF EACH CYCLE

Rudolph F. Pasos, Burlingame, Calif., assignor to Fairchild Camera and Instrument Corporation, Syosset, Long Island, N.Y.

Filed Feb. 24, 1969, Ser. No. 801,475
Int. Cl. H03b *3/04, 5/18*
U.S. Cl. 331—96 **4 Claims**

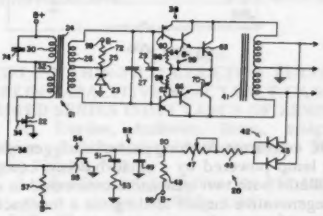


By varying the voltage applied to two oppositely poled varactors, placed in series in the resonant circuit of a microwave oscillator, the portion of each oscillatory cycle in which each varactor acts as a capacitor as opposed to a low resistance, is varied, thereby linearly varying the oscillatory frequency of the circuit.

3,582,824
AUDIO OSCILLATOR

Cecil C. Lencioni, Jr., Chicago, Ill., assignor to Beckman Instruments, Inc.

Filed Jan. 31, 1969, Ser. No. 795,600
Int. Cl. H03b *3/02*
U.S. Cl. 331—109 **14 Claims**



A temperature compensated, direct current feedback loop stabilizes the output level of an audio oscillator and gives the

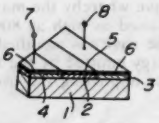
oscillator a negative effective output impedance, so that the oscillator can maintain a low distortion, constant level sine wave across the terminals of a remotely located load.

3,582,825

VARIABLE FREQUENCY SOLID-STATE OSCILLATOR

Masatoshi Migitaka, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed July 19, 1968, Ser. No. 746,116
Claims priority, application Japan, July 31, 1967, 42/48,800
Int. Cl. H03b *7/06*
U.S. Cl. 331—107G **4 Claims**



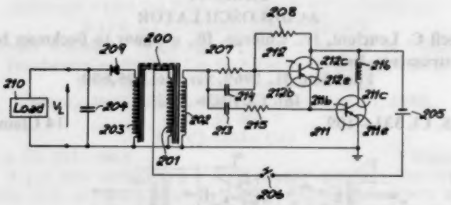
A variable frequency solid-state oscillator having on a surface of a trapezoid-shaped semiconductor substrate a laterally trapezoid-shaped epitaxial layer of N-type semiconductor monocrystal, the four sides of the trapezoid being planes of cleavage, a negative electrode being provided on the shorter side of the parallel opposite sides of the semiconductor layer on the substrate, and a positive electrode being provided on the longer side of the parallel opposite sides of the semiconductor layer on the substrate. Said oscillator oscillates with a frequency corresponding to the applied voltage when various values of voltage are applied to said device through said electrodes with means for applying excitation voltages.

3,582,826

TRANSISTOR BLOCKING OSCILLATOR FOR TRIGGERING AN INTERMITTENTLY ENERGIZABLE LOAD

Giorgio Del Zotto, Milan, Italy, assignor to Ates Componenti Elettronici S.p.A., Milan, Italy

Filed Apr. 7, 1969, Ser. No. 814,119
Claims priority, application Italy, Apr. 5, 1968, 14.862A/68
Int. Cl. H03k *3/30*
U.S. Cl. 331—112 **8 Claims**



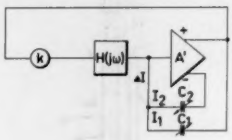
A DC to DC converter, forming part of a trigger system for a photoflash lamp powered by a small battery, comprises a blocking oscillator with two transistors connected in cascade and with a regenerative circuit leading via a feedback transformer by way of respective capacitors to the bases of the two transistors in parallel, the emitter-collector path of one transistor lying in series with the base-emitter path of the other transistor.

3,582,827

OSCILLATOR WITH PHASE-SHIFTING TUNING CAPACITANCE IN PARALLEL WITH FREQUENCY SENSITIVE FEEDBACK NETWORK

Bjourn E. Bjerede, 498 Fairwood Circle, Rochester, N.Y.

Filed Oct. 21, 1968, Ser. No. 769,069
Claims priority, application Sweden, Apr. 27, 1965, 5473/65
Int. Cl. H03b *5/00*
U.S. Cl. 331—135 **2 Claims**



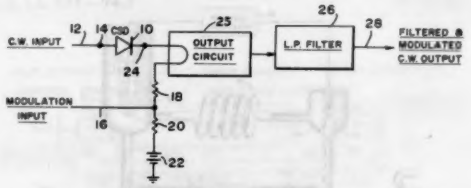
A low frequency oscillator having a frequency sensitive feedback network between its output and input is tuned by one or two separate feedback paths containing variable capacitance means operative to vary the phase shift of currents flowing in said feedback network.

3,582,828

CHARGE STORAGE DIODE MODULATORS AND DEMODULATORS

Milton H. Brockman, Glendale, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed July 12, 1968, Ser. No. 744,522
Int. Cl. H03c *3/22*
U.S. Cl. 332—16 **3 Claims**



Circuits for the modulation or demodulation of radio frequency signals comprising a charge storage diode which can provide a reverse current with a current-time integral equal to that of a forward current which has previously passed through the diode. In the modulator circuit, the carrier signal is coupled to pass through the diode, while the modulating signal (which varies in amplitude) biases the diode to govern the phase at which it conducts. The diode output is phase- and amplitude-modulated, but has no DC component. In the demodulator circuit, a constant radio frequency signal is coupled to pass through the diode, while the signal to be phase-demodulated biases the diode to govern the phase at which it conducts. This produces an amplitude-modulated output having no DC component.

3,582,829

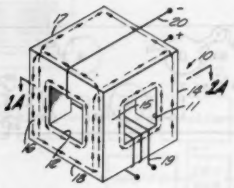
MODULATING SYSTEMS INCORPORATING AN ELECTRICALLY VARIABLE INDUCTANCE AS A MODULATING ELEMENT

Leslie K. Wanlass, Newport, Calif., assignor to Wanlass Electric Company, Santa Ana, Calif.

Division of Ser. No. 455,939, May 14, 1965, Pat. No. 3,403,323, continuation-in-part of Ser. No. 857,083, Dec. 3, 1959, abandoned. This application Aug. 5, 1968, Ser. No. 750,221
Int. Cl. H03c *3/12, 1/00*
U.S. Cl. 332—29 **8 Claims**

Modulating systems in which modulation, either AM or FM is accomplished by use of an inductor, the impedance of which can be electrically varied. The inductor comprises a first winding wound on a magnetic core having four legs or

common regions joined by end regions. A source of control current is connected to another winding wound on the core generally transverse to the first winding, the control current



in the second winding controlling the inductance of the first. The variable inductor is used as a series impedance in AM modulation systems and as part of a tuned circuit in FM modulating systems.

3,582,830

SEMICONDUCTOR DEVICE INTENDED ESPECIALLY FOR MICROWAVE PHOTODETECTORS

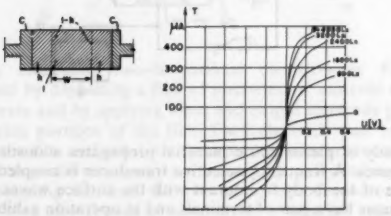
Jerzy Pultorak, and Michal Rzewuski, both of Warszawa, Poland, assignors to Polska Akademia Nauk, Instytut Technologii Elektronowej, Warszawa, Poland

Filed Sept. 5, 1968, Ser. No. 757,606

Claims priority, application Poland, Sept. 8, 1967, Sept. 12, 1967, P122507;P122522

Int. Cl. H03c *1/00, 1/14, 1/34*

U.S. Cl. 332—52 **3 Claims**



A semiconductor device having a lightly doped central region flanked by two heavily doped regions, all of the same conductivity type, with ohmic contacts to the heavily doped regions for applying bias voltage to the device. The thickness of the lightly doped region is less than the diffusion length of minority carriers therein, and the thickness of the heavily doped regions is greater than the diffusion length of the minority carriers therein. Light of varying amplitude applied to the lightly doped region is detected.

3,582,831

LOW RELUCTANCE RESONANT STRUCTURE IN WAVEGUIDE FOR ISOLATING DC MAGNETIC FIELDS

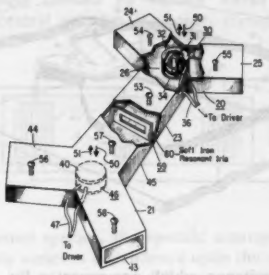
Wieslaw W. Siekanowicz, Trenton; Thomas E. Walsh, Kearny, and Donald J. Blattner, Princeton, all of, N.J., assignors to Radio Corporation of America

Filed Mar. 18, 1969, Ser. No. 808,245

Int. Cl. H01p *1/32, 5/00;* **H01f** *27/36*

U.S. Cl. 333—1.1 **8 Claims**

The deleterious interaction of DC magnetic fields, where closely spaced, latching ferrite, waveguide circulators are



employed, is overcome by the placement of a magnetic shield in the waveguide between the circulators.

3,582,832

AUTOMATICALLY CONTROLLED EQUALIZER UTILIZING A FIELD EFFECT TRANSISTOR

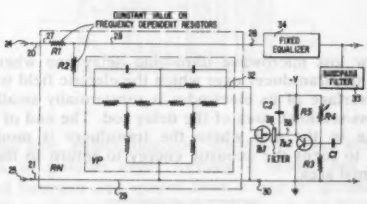
Hans Erwin Junge, and Rolf Geibig, both of Backnang, Germany, assignors to Telefunken Patentverwertungsgesellschaft m. b. H., Ulm Danube, Germany

Filed Nov. 17, 1969, Ser. No. 877,533

Claims priority, application Germany, Nov. 16, 1968, P 18 09 420.

Int. Cl. H04b *3/06, 3/10*

U.S. Cl. 333—18 **8 Claims**



A rapidly variable equalizer circuit for automatically compensating for changes in the frequency dependent loss of transmission lines due to changes in temperature and environmental conditions includes a passive four-terminal control network having a second four-terminal network connected within it as part of a shunt resistance and a field effect transistor having its source-drain path connected to terminate the output of the second four-terminal network. The control voltage for this field effect transistor is derived from a signal transmitted over the line and having an assigned frequency by means of a peak voltage rectifier having an adjustable threshold level.

3,582,833

STRIPLINE THIN-FILM RESISTIVE TERMINATION WHEREIN CAPACITIVE REACTANCE CANCELS OUT UNDESIRED SERIES INDUCTANCE OF RESISTIVE FILM

Ronald W. Kordos, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

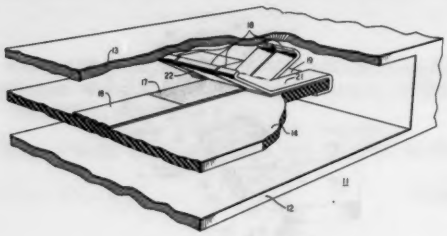
Filed Dec. 23, 1969, Ser. No. 887,588

Int. Cl. H01p *1/26*

U.S. Cl. 333—22 **4 Claims**

A thin-film resistive termination is presented for impedance matching microwave strip lines over a broad frequency band with a leaf spring connecting the resistor to

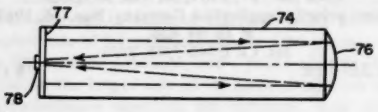
the upper ground plane of the termination. The leaf spring is sloped along the length of the resistive film to produce a distributed capacitance which compensates for the series inductance of the resistive film.



3,582,834
MICROWAVE ULTRASONIC DELAY LINE

Gary E. Evans, Hanover, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 10, 1968, Ser. No. 720,291
Int. Cl. H03h 9/30
U.S. Cl. 333—30 **2 Claims**

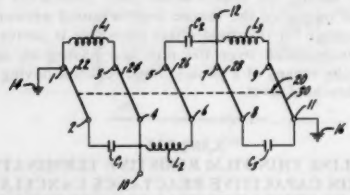


A low loss microwave ultrasonic delay line wherein the area of the transducer over which the electric field is normal to the surface of its electrodes is substantially smaller than the cross-sectional area of the delay rod. The end of the rod opposite to the end where the transducer is mounted is shaped to focus the acoustic energy to return to the aforementioned area.

3,582,835
FILTER SWITCHING CIRCUIT

Eugene C. Walding, Arlington Heights, Ill., assignor to Oak Electro/netics Corp., Crystal Lake, Ill.

Filed July 28, 1969, Ser. No. 845,232
Int. Cl. H03h 7/10
U.S. Cl. 333—70 **7 Claims**

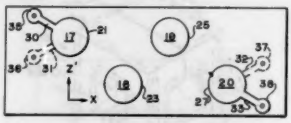


A filter switching circuit including a plurality of inductive and capacitive circuit elements. In one position of a two-position switch all of the circuit elements are connected to form a band-pass filter between an input and an output. In the other position of the switch the same circuit elements are connected to form a band-stop or band rejection filter.

3,582,836
MONOLITHIC CRYSTAL FILTERS

Robert L. Kent, Andover, Mass., assignor to Damon Engineering, Inc., Needham Heights, Mass.

Filed July 1, 1969, Ser. No. 838,155
Int. Cl. H03h 9/00
U.S. Cl. 333—72 **9 Claims**

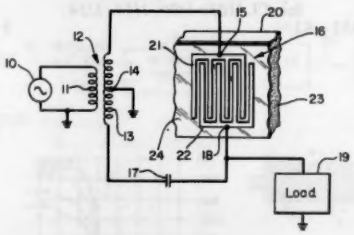


The monolithic crystal filters disclosed herein depart from previously known constructions in that adjacent resonators on a quartz plate are disposed on lines which are intermediate the X and Z' axes of the plate. In particular constructions the lines between successive resonator pairs lie in different quadrants relative to the X and Z' axes so that physically nonlinear arrays are formed.

3,582,837
SIGNAL FILTER UTILIZING FREQUENCY-DEPENDENT VARIATION OF INPUT IMPEDANCE OF ONE-PORT TRANSDUCER

Adrian J. DeVries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 8, 1967, Ser. No. 681,524
Int. Cl. H03h 9/32
U.S. Cl. 333—72 **14 Claims**



A body of piezoelectric material propagates acoustic surface waves. A frequency-selective transducer is coupled to a surface of the body to interact with the surface waves. The transducer has a pair of terminals and in operation exhibits at those terminals an impedance that has a significant resistive component to signals of a predetermined frequency but which has a relatively insignificant resistive component to signals of frequencies within a desired operating range but differing from that predetermined frequency. Input signals are fed to the transducer while output signals are derived therefrom. The system constitutes a filter which need have but a single transducer element coupled to the acoustic waves.

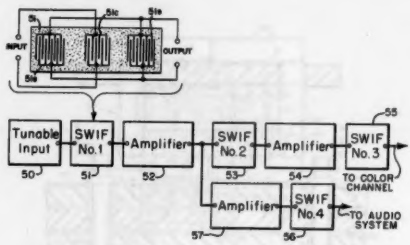
3,582,838
SURFACE WAVE DEVICES

Adrian J. DeVries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Continuation-in-part of application Ser. No. 582,387, Sept. 27, 1966, now abandoned. This application Apr. 12, 1968, Ser. No. 721,038
Int. Cl. H03h 7/10
U.S. Cl. 333—72 **22 Claims**

A turnable wave signal receiver uses an acoustic filter system for interstage coupling and for obtaining a particular frequency response. For a television receiver, the acoustic system is included in the IF channel and imposes a desired IF characteristic with traps or null points at selected frequencies

spaced from the IF carrier frequency and determined by the structure of interaction surface wave devices included in the acoustic filter system. For use in an FM receiver, the acoustic filter system serves as the discriminator to perform the necessary function of converting frequency to amplitude changes.



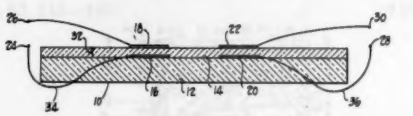
Additionally, particular forms of surface wave interaction devices for the acoustic filter system are disclosed as well as structural arrangements for tuning the system of controlling reflections of acoustic surface waves.

3,582,839

COMPOSITE COUPLED-MODE FILTER

Kendall A. Pim, Cleveland Heights, and Don A. Berlincourt, Chagrin Falls, both of, Ohio, assignors to Clevite Corporation

Filed June 6, 1968, Ser. No. 734,911
Int. Cl. H03h *9/32*
U.S. Cl. 333—72 **8 Claims**



An essentially two-dimensional electric-wave filter is formed by depositing a film of piezoelectric material upon a substrate and by applying input and output electrode pairs to different portions of the film. Each electrode pair together with the film and substrate form a composite resonator. The two composite resonators are located for a desired mechanical coupling between the two composite resonators. The filter may also consist of an array of *n* coupled composite-resonators having a common film and a common substrate and having the electrode pairs of two resonators of the array serving as input and output electrodes.

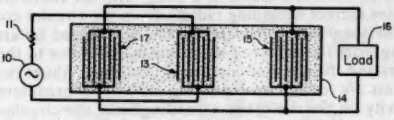
3,582,840

ACOUSTIC WAVE FILTER

Adrian J. DeVries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Continuation-in-part of application Ser. No. 721,038, Apr. 12, 1968, which is a continuation-in-part of application Ser. No. 582,387, Sept. 27, 1966, now abandoned. This application Mar. 20, 1969, Ser. No. 808,920
Int. Cl. H03h *9/20, 9/30*
U.S. Cl. 333—72 **14 Claims**

A body of piezoelectric material propagates acoustic surface waves. A central transducer is coupled to a surface of the body to interact with those waves. Spaced on the same surface generally symmetrically individually with respect to that central transducer are a pair of outer transducers. Each of the three transducers includes interleaved combs of conductive electrodes that are spaced apart effectively by one-half the approximate wavelength of the surface waves. The combs of the outer transducers are mutually arranged, relative to the central transducers, such that surface waves propagating between the central and one of the outer transducers create electrical signals additively related in phase to electrical signals created by surface waves propagating between the central and the other outer transducers. In the several illustrated species, the specific arrangement of the different combs varies in dependence upon the number of individual comb electrodes in the different transducers and the choice as between series or parallel interconnection of the outer transducers.

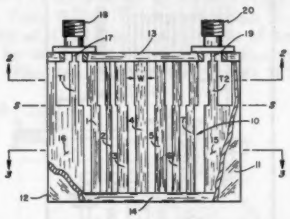


3,582,841

LADDER LINE ELLIPTIC FUNCTION FILTER

John David Rhodes, Natick, Mass., assignor to Microwave Development Laboratories, Inc., Needham Heights, Mass.

Filed Mar. 24, 1969, Ser. No. 809,593
Int. Cl. H03h *7/08*
U.S. Cl. 333—73 **3 Claims**



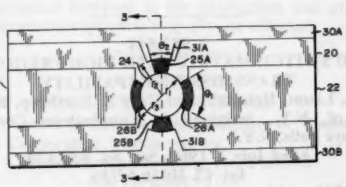
A band pass, elliptic function, microwave filter employs a network of parallel digits forming a ladder line that is disposed between and spaced from a pair of ground plane plates. Each digit is a half wavelength long at the filter's mid-band frequency. Each digit is short circuited at both its ends to the ground planes and is stepped in impedance. Input and output coupling to the ladder line are accomplished by transformer digits located at the ends of the ladder line.

3,582,842

RESISTIVE FILM CARD ATTENUATOR FOR MICROWAVE FREQUENCIES

David S. Friedman, Framingham, Mass., assignor to Sage Laboratories, Inc., Natick, Mass.

Filed Aug. 28, 1969, Ser. No. 853,792
Int. Cl. H01p *1/22, 1/26;* **H01c** *7/00*
U.S. Cl. 333—81 **10 Claims**



A microstrip attenuator includes a ground plane and a signal conductor supported on a dielectric material above the

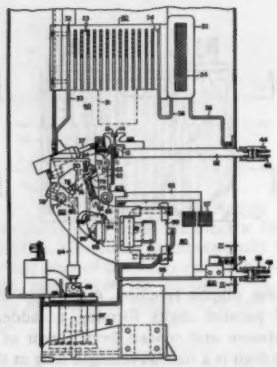
ground plane. The signal conductor is interrupted for a portion of its length. A circular conductor having a diameter less than the length of interruption is placed on the dielectric with its center at the center of the gap between the portions of the signal conductor. Resistive material of predetermined resistivity is deposited on the dielectric extending from the circular conductor to the edges of signal conductors. Each deposition defines a sector of a circle with the transverse extremities thereof extending radially from the circular conductor. The longitudinal extremities are determined by arcs extending from the center of the circular conductor to the conductors and the circular conductor periphery. Shunt resistive elements are formed by depositing material of predetermined resistivity on the dielectric extending from the circular conductor in a direction essentially transverse of the direction of propagation. Likewise, the shunt resistive configuration defines a sector of a circle extending from the circular conductor to a second conductor essentially maintained at ground plane potential.

3,582,843

TRIPPING MEANS FOR HIGH SPEED CIRCUIT INTERRUPTERS

Joseph D. Findley, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1969, Ser. No. 866,328
Int. Cl. H01h *71/28*
U.S. Cl. 335—21 **8 Claims**



A circuit interrupter having a tripping means including a means which is responsive to a predetermined magnitude of current in the circuit to be protected which flows in an electrical conductor which forms part of the circuit interrupter. The latter means includes a magnetic beam member which is pivotally supported on an associated first magnetic member and includes a free end which is movable with respect to a second magnetic member in response to the changes in the current in the associated electrical conductor. A spring means which is operatively connected to the magnetic sheet member adjacent to the other end of the magnetic sheet member biases the free end of the magnetic sheet member away from the second magnetic member.

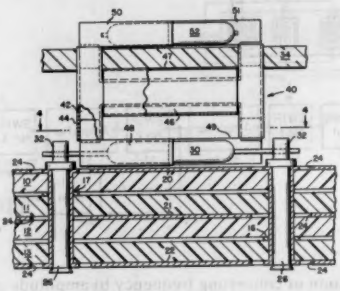
3,582,844

REED SWITCH MATRIX WITH HIGH FREQUENCY TRANSMISSION CAPABILITY

Larry L. Launt, Holcomb, and Gary E. Northrup, Rochester, both of, N.Y., assignors to Cunningham Corporation, Honeoye Falls, N.Y.

Filed July 7, 1969, Ser. No. 839,479
Int. Cl. H01h *67/30*
U.S. Cl. 335—112 **3 Claims**

A strip-line crossbar switch with reed switches at the crosspoints and optional magnetic latching, especially suitable for switching signals at frequencies of up to several tens of megahertz. Magnetic fields for actuating the reed switches are applied transversely across, and highly concentrated at the contact points. The actuating fields are generated by coils wound on magnetic cores, and are directed to the reed



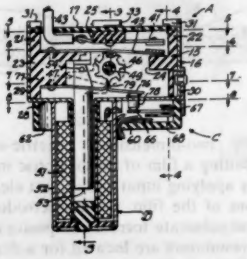
switches by pole pieces, which extend along and on opposite sides of the reed switches, and also function as magnetic shields to reduce magnetic coupling between adjacent crosspoints.

3,582,845

POWER RELAY WITH LOW VOLTAGE CONTROL

Wilhelm W. Brockway, 16188 Meadowcrest Road, Sherman Oaks, Calif.

Filed Mar. 18, 1970, Ser. No. 20,593
Int. Cl. H01h *51/08*
U.S. Cl. 335—140 **12 Claims**



A power relay, in a protective casing, is demountably attached to a low voltage relay control switch in a separate insulating casing adapted for attachment to the bottom side of a conventional outlet box, with the power relay solenoid projecting outside the box. A solenoid, operated by low voltage pulses directed through the low voltage relay control switch from a remote momentary switch and power source, progressively actuates a stepping rotary cam to alternately make and break the power relay in response to successive pulses, and a mechanical connection between the cam and the low voltage relay control switch through the bottom of the power relay casing, reverses the low voltage relay control switch each time the power relay is reversed.

3,582,846

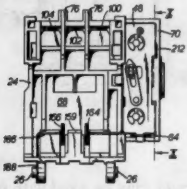
ELECTRIC MOTOR STARTERS

Albert W. J. Berry, Brighton, England, assignor to Allen West (Brighton) Ltd.

Filed Apr. 7, 1969, Ser. No. 814,000
Int. Cl. H01h *50/04*
U.S. Cl. 335—131 **8 Claims**

An electric motor starter unit has "start" and "stop" pushbuttons, a solenoid, main contact sets operable by the solenoid, an auxiliary contact set in the solenoid energizing cir-

cuit operable by the "start" pushbutton and engageable by the main moving contact carrier to hold the solenoid energized, and an overcurrent trip release device. The insulating moulding is in two parts hinged together, namely a base part



on which the auxiliary contact set is mounted and an upper part containing the pushbuttons and the trip release device. A current-sensing unit for the trip release device is a separate unit quickly detachable from the upper insulating moulding part for replacement purposes.

3,582,847

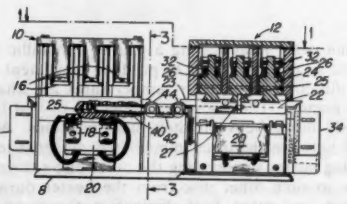
MECHANICAL SWITCH INTERLOCK

Ralph H. Johnson, Manchester, Conn., assignor to Arrow-Hart, Inc., Hartford, Conn.

Filed July 28, 1969, Ser. No. 845,186

Int. Cl. H01h *9/20*

U.S. Cl. 335—160 **7 Claims**



An interlock structure prevents inadvertent actuation of the second of a pair of relay switches after actuation of the first of the pair. Rods are moved into the nonactivated switch to block movement of its mechanism.

3,582,848

MOUNTING ASSEMBLY FOR MAGNETIC DEFLECTION YOKE

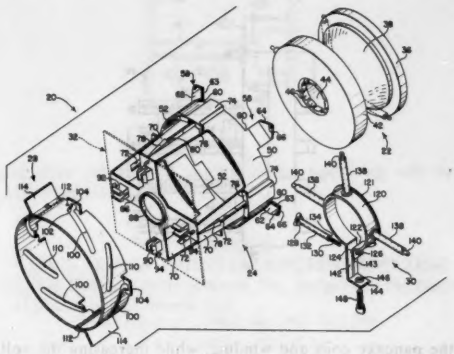
Francis E. Ryder, Island Lake, and Julian V. Fisher, Carpentersville, both of, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 13, 1969, Ser. No. 790,520

Int. Cl. H01f *1/00*

U.S. Cl. 335—212 **21 Claims**

A nonmagnetic mounting assembly for maintaining a magnetic deflection yoke in predetermined relationship to the neck of a cathode-ray tube. The mounting assembly is capable of moving said yoke axially relative to the neck of said tube while maintaining a predetermined rotational and/or canted angular relationship between said yoke and neck and



also presents the capability of adjusting the angular relationship between said yoke and neck without affecting the axial relationship.

3,582,849

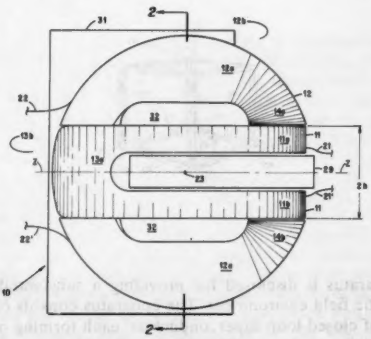
ELECTROMAGNETIC APPARATUS FOR PRODUCING AND CONTAINING HIGH TEMPERATURE PLASMAS

Richard F. Post, Walnut Creek, and Ralph W. Moir, Livermore, both of, Calif. The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 3, 1969, Ser. No. 881,787

Int. Cl. H01f *5/00*

U.S. Cl. 335—213 **8 Claims**



Electromagnetic apparatus including a pair of C-shaped field coil segments which produce a magnetic field defining a quadrupole-type magnetic potential well suitable for containing a high temperature plasma. The segments are adapted to be separately or concurrently energized with equivalent or relatively variable electrical currents so as to produce deeper potential wells for more effective containment and to permit a wide variety of manipulations, not possible with previous designs, to facilitate trapping and heating of the plasma. Other operations involved in the production and utilization of high temperature plasmas may also be effected.

3,582,850

ELECTRICAL WINDINGS

Robert I. VanNice, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

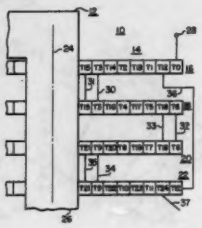
Filed Dec. 10, 1969, Ser. No. 883,843

Int. Cl. H01f *15/14*

U.S. Cl. 336—70 **11 Claims**

Windings for electrical inductive apparatus having a plurality of pancake coils arranged in a stack. Each pancake coil

has first and second coil sections, the turns of which are radially interleaved. The coil sections of the pancake coils are electrically interconnected to substantially reduce the magnitude of voltage oscillations at the first resonant frequency



of the pancake coils and winding, while increasing the voltage between adjacent turns of the interleaved coil sections in a pancake coil to at least three times the steady state voltage across a coil section.

3,582,851

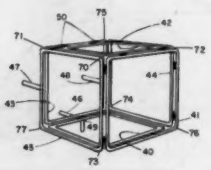
APPARATUS ADAPTED TO PROVIDE A ZERO MAGNETIC FIELD ENVIRONMENT

Robert H. Meservey, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of application Ser. No. 690,145, Dec. 6, 1967, now Patent No. 3,504,283. This application Mar. 9, 1970, Ser. No. 17,446

Int. Cl. H01f *27/28*

U.S. Cl. 336—73 **14 Claims**



Apparatus is disclosed for providing a substantially zero magnetic field environment. The apparatus consists of a plurality of closed-loop superconductors, each forming one side of a boxlike enclosure. The sides are flexibly joined to allow them to be rendered superconductive while all are disposed in one plane or in parallel planes or moved accordion fashion to configurations which present minimum areas through the central openings of the loops and thereafter to be repositioned to form a boxlike structure, the inner portion of which is entirely surrounded by the superconductive sides which prevents entry of flux lines into said inner portion.

3,582,852

WINDOW-TYPE CURRENT TRANSFORMER HAVING MEANS FOR MOUNTING ON A PRIMARY BAR

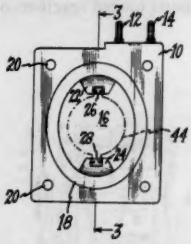
Ralph B. Stetson, Durham, and John A. Smith, Rochester, both of, N.H., assignors to General Electric Company

Filed Feb. 24, 1970, Ser. No. 013,314

Int. Cl. H01f *27/30, 40/06*

U.S. Cl. 336—174 **5 Claims**

A window-type current transformer in which a pair of plastic locating members are molded in the window opening and have channels to receive and hold a rectangular primary conductor. The plastic locating members are especially adapted to fit the secondary bushing blades of pad mounted transformers. The plastic members may be removed so that



the current transformer may be used with other primary conductors, such as insulated cables.

3,582,853

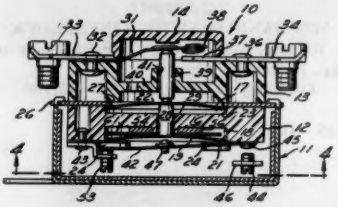
TIME DELAY RELAY

Rexford M. Morris, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Sept. 22, 1969, Ser. No. 859,854

Int. Cl. H01h *61/013*

U.S. Cl. 337—102 **19 Claims**



A time delay relay having a pair of bimetallic snap discs mounted so that they tend to produce movement in the opposite direction when their temperatures are changed in a similar manner. The discs are connected so that they simultaneously move between their snap positions. A heater is located between the discs immediately adjacent to one disc. Insulating means surrounding the other disc restricts the rate of flow to such other disc from the heater during heating operation and resist heat dissipation therefrom after the heater is turned off. The heater creates rapid rates of increase in differential temperature between the discs when operation of the heater is initiated and similar high rates of change in differential temperature occur when the heater is shut off. The discs are selected so that a compressive force is applied to the connecting operator under all conditions normally encountered and snapping of the discs occurs when a predetermined differential temperature exists between the discs. Because the discs apply compressive forces to the operator under all normal operating conditions, a simple bumper-type connector may be used to connect the discs and the discs need not be trapped at their peripheries.

3,582,854

THERMAL ACTUATOR

Howard A. Powers, Medfield, and William F. Saunders, Sherborn, both of, Mass., assignors to Fenwal, Inc., Ashland, Mass.

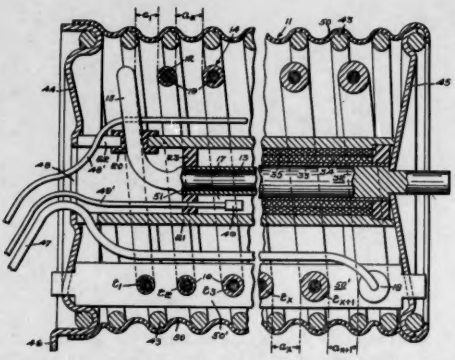
Filed Apr. 30, 1968, Ser. No. 725,402

Int. Cl. H01h *37/46, 61/06, 71/18*

U.S. Cl. 337—139 **30 Claims**

An actuator with a thermally responsive elongated body of expansible material adapted for changes between solid and

liquid states. A heat transfer mechanism produces incrementally varying temperatures longitudinally of the elongated body so as to provide progressive melting and hardening thereof.

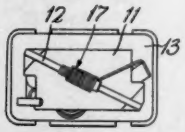


3,582,855

THERMAL SWITCH WITH FLEXIBLE VANE

Eric Bernard Parkes, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 20, 1969, Ser. No. 835,056
Claims priority, application Great Britain, July 2, 1968, 31454/68
Int. Cl. H01h *37/50*
U.S. Cl. 337—139 **2 Claims**



A thermally operable switch including a vane which is movable between a stable position and an unstable position in response to thermal expansion and contraction of a part associated with the vane. Contacts operable in response to said movement of the vane, and lagging associated with said part, the lagging increasing the cooling time of said part, and thereby increasing the time interval between consecutive operations of the contacts.

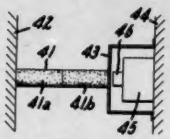
3,582,856

TEMPERATURE SENSING RELAY

Donald L. Watrous, Liverpool, and John D. Harnden, Jr., Schenectady, both of, N.Y., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 768,693, Oct. 18, 1968, Division of Ser. No. 635,577, May 2, 1967, Pat. No. 3,464,225. This application June 18, 1969, Ser. No. 834,372
Int. Cl. H01h *37/32, 37/46*
U.S. Cl. 337—382 **2 Claims**

Temperature sensors in pilot contact and sensor relays are comprised by first order transition materials which provide an abrupt change in at least one of the properties thereof, in particular volume, at predesigned transition temperatures in response to variations in temperature over a given range. Due to the hysteresis characteristics built into the sensors through the use of suitable first order transition materials, the transition temperature values will be different as the temperature increases from a lower to a higher temperature from the transition temperature value as the temperature decreases from a higher to a lower temperature. Preferably a two-part sensor is used employing high and low metallic compound transition temperature materials. An application is a solid state refrigerator control circuit operating with two-point temperature control.

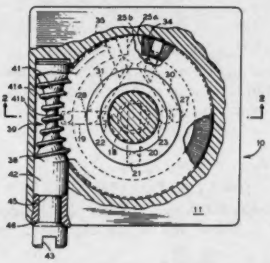


3,582,857

WORM-DRIVEN ADJUSTABLE POTENTIOMETERS

Joseph F. Kishel, Clarks Summit, Pa., assignor to Weston Instruments, Inc., Newark, N.J.

Filed Sept. 27, 1968, Ser. No. 763,226
Int. Cl. H01c *5/02, 9/02*
U.S. Cl. 338—174 **8 Claims**



A low-cost, worm-driven potentiometer is described which may be constructed using only a few components and yet retains good performance characteristics. Components which are conventionally used in this type of potentiometer, but which may at least be omitted in accordance with the instant invention without deleteriously affecting performance characteristics, especially the specific tolerance of resolution, include axial constraints for preventing the driving worm from moving axially in the potentiometer housing. This is made possible by utilizing a worm-drive comprising a driving worm having a threaded section of hourglass profile and a driven spur gear. The meshing engagement between the worm and gear is preferably effected with at least an interference tooth contact and the hourglass worm-drive provides self-nullification of axially directed forces which would tend to cause resultant axial displacements of the worm upon worm rotation. Further simplification is made possible by utilizing a collector pin as the axial support for the driven gear and as a means for preventing the overdriving of a contact element rotatable with the driven gear. Moreover, the contact element cooperates with the collector pin to provide a resilient axial support for the driven gear.

3,582,858

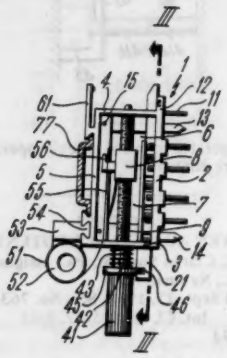
SYSTEM MODULAR UNIT HAVING A POTENTIOMETER SWITCH ARRANGEMENT FOR TUNING DEVICES OF HF-COMMUNICATION TRANSMISSION APPARATUS

Peter Hengstler, Deisslingen, and Lothar Volkheimer, Trossingen, both of, Germany, assignors to R. & E. Hopt KG, Auf der Breite, Germany

Filed Feb. 4, 1969, Ser. No. 796,467
Claims priority, application Germany, Feb. 9, 1968, 1616265
Int. Cl. H01c *9/08, 5/08*
U.S. Cl. 338—179 **22 Claims**

A modulator-switch unit for use with tuners for HF-communications equipment contains a potentiometer consisting

of a resistance element and a slider arranged on a tuning spindle disposed within a housing and provided with a pushbutton. The pushbutton is slidably supported within the housing parallel to the tuning spindle and is employed to actuate the switches so that the potentiometer may be connected to a desired tuned circuit by way of connecting studs projecting from the bottom of the housing.



3,582,859

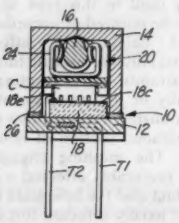
LEADSCREW-ADJUSTED POTENTIOMETER SLIDER

Joseph R. DeRouen, Banning; William H. King, Riverside, and Raymond T. Dion, Rialto, all of, Calif., assignors to Bourns, Inc.

Filed May 2, 1969, Ser. No. 821,415

Int. Cl. H01c *9/02, 5/02*

U.S. Cl. 338—180 **3 Claims**



A special contact-carrier or slider for leadscrew-adjusted potentiometers, consisting of an insulative block having a longitudinal screw-receiving groove and a transverse slot in which is fitted a resilient screw-engaging yoke which facilitates assembly of the contact-carrier and potentiometer and permits overdrive of the actuating screw without damaging effect on the potentiometer.

3,582,860

ELECTRICAL CONTROL DEVICE

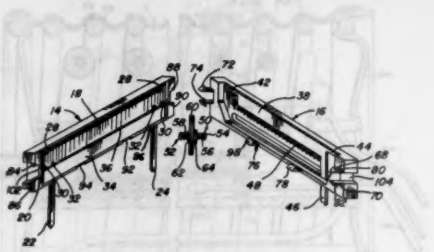
Sidney Milovac, Oak Lawn, Ill., assignor to Selectron International Co., Inc., Chicago, Ill.

Filed May 5, 1969, Ser. No. 821,790

Int. Cl. H01c *9/02*

U.S. Cl. 338—183 **11 Claims**

Electrical signal control is achieved by a device utilizing uniformly spaced resistive and conductive elements, each of which has one of a pair of electrically connected contacts bearing against it. An actuator is utilized to simultaneously displace the contacts in order to control the characteristics of a signal applied to the device. A gear arrangement provides positive setting. The device may be formed in the shape of a rectangular parallelepiped to permit stacking with a plurality of other such devices.



3,582,861

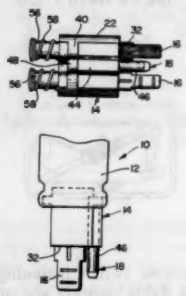
SOCKET ASSEMBLY HAVING GROUND PIN

Richard J. Mangini, Hudson, Mass., assignor to United-Carr Incorporated, Boston, Mass.

Filed Sept. 27, 1968, Ser. No. 763,208

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 **1 Claim**



This invention is directed at an electric socket having an insulating insert engaged within a metal shell. The insert has a ground pin associated with it comprising a head portion and a shank portion extending therefrom. The head portion is adapted to fit within a slot formed in a flange of the insert so that the upper surface of the head portion lies on the same plane as the upper surface of the flange and the shell is electrically engaged with the head portion.

3,582,862

CONNECTOR DEVICE WITH INTEGRAL REFERENCE PLANE

Norman Richard Anderson, Cicero, Ill., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

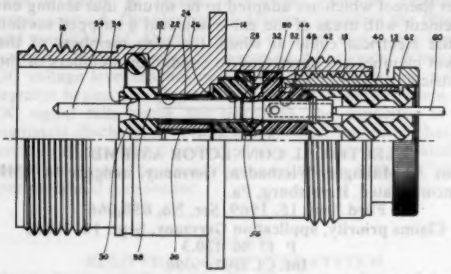
Filed Jan. 22, 1969, Ser. No. 793,007

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 **2 Claims**

A connector having a hollow elongated casing of an electrically connecting material. A bulkhead, formed as part of the casing, is positioned across the hollow opening. There are a plurality of holes formed in the bulkhead each of which has a spring clip of electrically conducting material mounted therein in electrical contact with the bulkhead. Pin means, which are adapted to pass through the holes, each have included as a part thereof an electrical filter having an outer

surface of conductive material. The filters are dimensioned to cause the outer surface to be in electrical contact with the



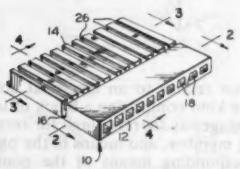
corresponding clip when the pin is properly positioned in the corresponding hole.

3,582,863

ELECTRICAL TERMINAL HOUSING HAVING HINGE AND ADJACENT LOCK PROJECTION

Eldon P. Hoffman, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 12, 1969, Ser. No. 806,432
Int. Cl. H05k *1/04*; H01r *11/02*
U.S. Cl. 339—17 **16 Claims**



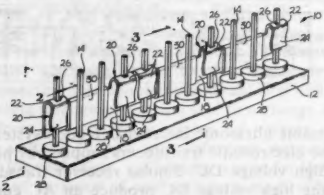
An electrical terminal housing is described which includes a first end portion having a row of chambers containing the connector terminals connected by a hinge portion to a second end portion having a row of slots releasably holding the connectors so that a locking projection thereon extends into notches formed in the connectors in one position of the hinge to prevent removal of the connector terminals from such chambers. In another position of the hinge, the lock projection disengages from the connector notches and such connectors are released from the slots to enable removal of the connector terminals from such chambers. The entire terminal housing may be molded as a single piece of polypropylene plastic including a flexible hinge of reduced thickness.

3,582,864

ELECTRICALLY CONDUCTING DEVICE

James L. Sullivan, 1504 Highland Ave., Manhattan Beach, Calif.

Filed Oct. 20, 1969, Ser. No. 867,831
Int. Cl. H01r *31/08*
U.S. Cl. 339—19 **4 Claims**



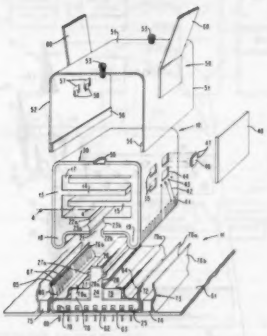
An electrical conducting device for a plurality of independent electrical contacts arranged in a row, the electrical conducting device having a single electrically conducting strip to be alignable adjacent the row of electrical contacts and capable of being electrically conductive therebetween, a plurality of spring-biased arms being attached to the strip to permit connection of the conductor to the contacts, each of the arms being capable of being separated from the strip, a nonelectrically conducting element being placeable upon the strip in the areas provided by the separated arms.

3,582,865

MICROCIRCUIT MODULE AND CONNECTOR

Donald R. Franck, Endicott, and Cortland P. Hill, Vestal, both of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1969, Ser. No. 885,596
Int. Cl. H01r *13/50*; H05k *1/00*
U.S. Cl. 339—17 **13 Claims**



Integrated circuit devices are mounted on a thin polyimide laminate substrate which is bonded around a heat sink and support member to form a module. Conductive circuit paths carried on both external and internal planes of the laminate substrate link the integrated device circuits to spaced contact areas along edge areas of the substrate. A pressure cap surrounds the module and is flexed with a tool to permit low insertion force engagement of the module with a board structure including a polyimide laminate socket having contact areas aligned for forcible engagement with the module contact areas by action of the pressure cap upon release of the tool. The pressure cap forces maintaining positive electrical engagement are applied parallel to the circuit board.

3,582,866

FLUORESCENT TUBE CONDUCTOR

Roy A. Johnson, Chicago, and Maurice M. Light, Oak Park, both of, Ill., assignors to Personal Service Manufacturing Corporation,, Chicago, Ill.

Filed Dec. 23, 1968, Ser. No. 786,144
Int. Cl. H01r *33/08*
U.S. Cl. 339—50 **2 Claims**

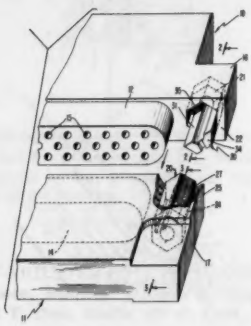
Apparatus to be attached to a pin of a fluorescent tube having two flat exterior electrically insulating sheets, each sheet having an opening; and having a flat electrically con-

ductive strip attached to the electrically insulating sheets and within the sheets having an opening lining up with the opening in the sheets through which the pin may pass such that the pin contacts the strip and allows electric current to be withdrawn from the pin and sent to any suitable foreign load requiring electricity; combination of such apparatus with a fluorescent tube: and method for withdrawing electric current from a fluorescent tube circuit by placing a flat metal strip over a pin and inserting the pin into the fluorescent tube circuit.

3,582,867
POLARIZATION MEANS FOR ELECTRICAL CONNECTORS

Wayne R. Thompson, Bainbridge, and Le Roy W. Fairbairn, Sidney, both of, N.Y., assignors to The Bendix Corporation

Filed Mar. 20, 1969, Ser. No. 808,775
Int. Cl. H01r *13/54, 13/64*
U.S. Cl. 339—92 **6 Claims**

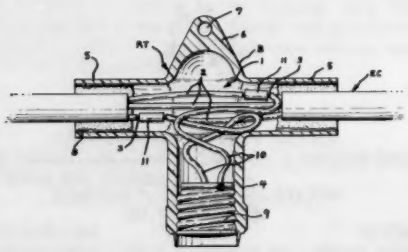


Polarizing means for the main parts of a separable electrical connector which carry mating electrical contacts. The polarizing means has two polarizing inserts removably mounted in selected angular positions on the respective connector parts, such inserts having portions which interfit to permit the connector parts to be mated only when the correct connector parts are presented to each other. In the embodiments shown, the polarizing inserts are made of yieldable plastic material, and are of such dimensions as to provide sufficient tolerances to prevent binding between them when the correct connector parts are mated.

3,582,868
SEALED RECEPTACLE TAP

John Omer Trimble; Mueller Arthur Malvern, Llewellyn; John Omer Trimble; Mueller Malvern, and Arthur Llewellyn, Berwyn, all of, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of application Ser. No. 768,335, Oct. 17, 1968, now abandoned. This application June 1, 1970, Ser. No. 041,734
Int. Cl. H01r *13/52*
U.S. Cl. 339—94L **2 Claims**

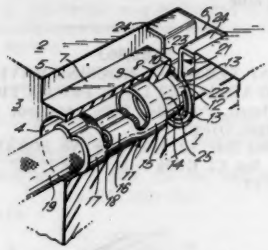


A receptacle tap for disposition onto an electrical cable comprises a first section having disposed therein an electrical socket member provided with wire members, a second section extending outwardly from the first section and defining heat-shrinkable portions having sealant means on inside surfaces thereof which are adapted to be shrunk into sealing engagement with areas of the cable adjacent a stripped section of the electrical cable at which the wire members of the socket member are connected to conductor members of the electrical cable.

3,582,869
ELECTRICAL CONNECTOR ASSEMBLY

Heinz A. Millinger, Wiesbaden, Germany, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 15, 1969, Ser. No. 858,066
Claims priority, application Germany, Sept. 16, 1968, P 17 90 130.3
Int. Cl. H01r *9/08*
U.S. Cl. 339—217 **8 Claims**

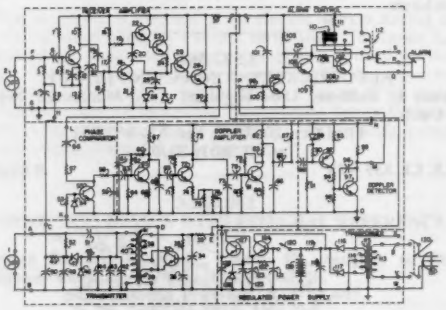


This invention relates to an electrical connector housing assembly of the kind comprising a block of insulating material having a passageway therethrough for receiving an electrical connecting member, and means in the passageway engaging with corresponding means of the connecting member when inserted in the passageway to retain the member in the passageway.

3,582,870
ULTRASONIC DETECTION SYSTEM

Charles H. Peterson, and Curtiss C. Krueger, both of San Diego, Calif., assignors to Normda Industries, Inc, San Diego, Calif.

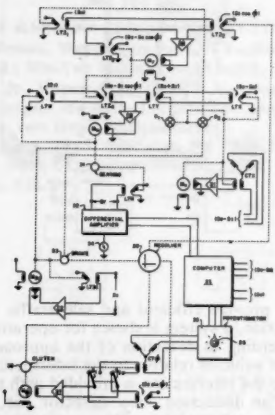
Filed Mar. 10, 1969, Ser. No. 805,724
Int. Cl. G01s *9/66*
U.S. Cl. 340—1 **17 Claims**



Highly stable ultrasonic intruder detection systems employ broad band electrostatic transducers supplied by high voltage AC and high voltage DC. Similar receiver transducers supplied by the high voltage DC produce an AC current upon receiving ultrasonic vibrations. An amplifier with inverse logarithmic gain characteristics amplifies the incoming signal and passes it to a transistorized comparator where any Doppler signal is extracted by comparing the incoming signal

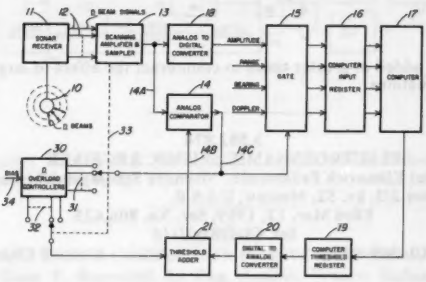
with the broadcast signal. Combined Doppler amplifiers and band-pass filters amplify the Doppler signal and remove portions of the signals which are higher or lower in frequency than a range of human movement Doppler producing frequencies. A Doppler signal detector converts the filtered and amplified AC Doppler signal to a DC signal that is proportional to the average of incoming AC signals. When the DC voltage level reaches or exceeds a threshold level, an integrator begins charging and continues to charge. When the DC signal falls below the threshold, the capacitor is immediately discharged. When the capacitor has been charged over a predetermined period of time, a relay is actuated to set off an alarm. The alarm continues as long as the DC Doppler threshold is exceeded.

3,582,871
ELLIPTICAL COMPUTER SYSTEM
Morris Snyder, Philadelphia, Pa. The United States of America as represented by the Secretary of the Navy
Filed Mar. 31, 1961, Ser. No. 99,965
Int. Cl. G01s *9/66*
U.S. Cl. 340—2 **7 Claims**



2. An elliptical computer system for determining the position of a submarine, comprising in combination: a first elliptical computer, a first input means for inserting into said first elliptical computer a voltage proportional to the direct distance between foci of a first ellipse, said foci of said first ellipse being the locations of a sonobuoy and a first charge dropped in sequence by an aircraft, a second input means for inserting into said first elliptical computer a voltage proportional to the difference between the distance from said first charge to said sonobuoy measured by way of a submarine and the direct distance between said sonobuoy and said first charge; a second elliptical computer, a first input means for inserting into said second elliptical computer a voltage proportional to the distance between foci of a second ellipse, said foci of said second ellipse being the locations of said sonobuoy and a second charge dropped by said aircraft, a second input means for inserting into said second elliptical computer a voltage proportional to the difference between the distance from said second charge to said sonobuoy measured by way of said submarine and the direct distance between said sonobuoy and said second charge, common input means for inserting into said first and said second elliptical computer a voltage proportional to the angle between the line connecting said sonobuoy and said first charge and a line connecting said sonobuoy and said first charge and a line extending from said sonobuoy, means for varying said common input voltage from a zero reference equivalent to a value of 0° for said angle, calibrating means for determining the amount of variance of said common input voltage, said first and second elliptical computers each having a voltage output variable with said common input voltage, comparison means having a first input connected to said first elliptical computer output and a second input connected to said second elliptical computer output, means connected to said comparison means for indicating zero comparison means output voltage when said first and second elliptical computer outputs are equal for a particular value of said common input voltage whereby values of said angle for which said computer outputs are equal are indicated on said calibrating means.

3,582,872
THRESHOLD CONTROL FOR SONAR
Roger H. Prager, San Diego, Calif. The United States of America as represented by the Secretary of the Navy
Filed June 29, 1964, Ser. No. 379,054
Int. Cl. G01s *3/00*
U.S. Cl. 340—6-R **4 Claims**



1. A sonar system comprising:
an omnidirectional transducer for converting sonic waves to electrical signals, and means for generating separate beam signals received along separate radial directions;

a voltage comparator with two inputs and one output;

a threshold voltage source coupled to one input of said comparator, first switch means for successively applying said separate beam signals to the other input of said comparator to pass to said output only those beam signals which exceed in amplitude the threshold voltage, a gate;

computer means coupled to the output of said comparator and responsive to all beam signals passed by said comparator, said computer means being responsive to said beam signals throughout a predetermined number of beam signal intervals of time for modifying the background threshold voltage;

a plurality of sonar signal overload controllers corresponding in number to the number of beam signals to be sampled;

second switch means for successively connecting said overload controllers to the output of said comparator;

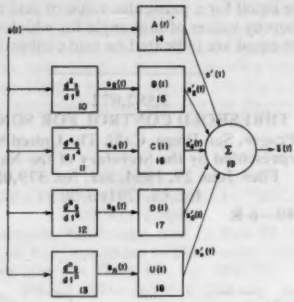
interlock means between said first and second switch means, and

means for successively adding each integrated signal voltage to said threshold voltage as each signal beam is sampled.

3,582,873
DYNAMIC AMPLITUDE RECOVERY
Charles Floyd George, Jr., 2600 Meandering Way, Plano, Tex.; Howard A. Slack, 4856 Nashwood Lane, Dallas, both of, Tex., and Ronald K. Scudder, 32 Via Florendo, Orinda, Calif.
Filed Oct. 15, 1968, Ser. No. 767,796
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 **6 Claims**

Processes for improving seismic signals whereby attenuated frequencies are restored. The restoration of a seismic

trace is accomplished by adding proper quantities of even numbered derivatives back into the trace with larger proportions added at greater times to counteract the effect of larger attenuations.

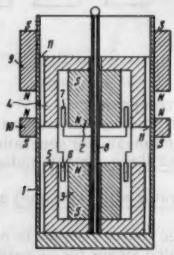


3,582,874

ELECTRODYNAMIC SEISMIC RECEIVER

Nikolai Efimovich Fedoseenko, Nizhnaya Syromyatnicheskaya ulitsa 2/3, kv. 52, Moscow, U.S.S.R.

Filed Mar. 12, 1969, Ser. No. 806,625
Int. Cl. G01v 1/16
U.S. Cl. 340—17 8 Claims



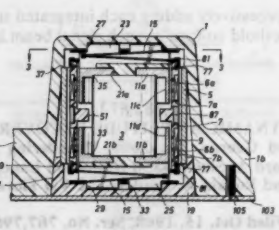
An electrodynamic seismic receiver is provided with a hollow housing in which is supported two magnets one of which is movable vertically. Also provided either externally of the housing or internally therein are a pair of shiftable control magnets, one of which acts on the movable magnet to set a neutral position, and the other of which control magnets acts on the movable magnet for controlling the vibration thereof.

3,582,875

GEOPHONE DEVICE

Stanley Herbert Van Wambeck, 44 Stillforest, Houston, Tex., and Frank Fisher Reynolds, Jr., 2306 Peckham, Houston, Tex.

Filed Nov. 12, 1968, Ser. No. 774,890
Int. Cl. G01v 1/16
U.S. Cl. 340—17 9 Claims



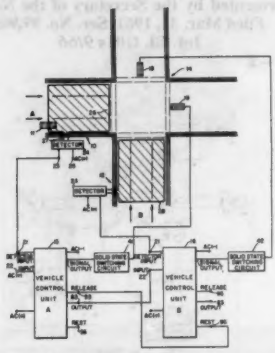
An improved seismometer or "geophone" for detecting and measuring subsurface geophysical reflections. The device comprises an outer housing having fixedly disposed therein a central magnet. Disposed about the magnet is circular manner are coil windings. The windings are supported at each end of the magnet and within the housing by cantilever mounted leaf springs, one of the leaf springs being prestressed in tension while the other is prestressed in compression so as to provide a sensitive, freely mounted coil about the magnet.

3,582,876

TRAFFIC RESPONSIVE CONTROL SYSTEM

Howard Carmack, 17034 Via Margarita, San Lorenzo, Calif., and Richard Urbaniak, 3265 Primrose Lane, Walnut Creek, Calif.

Filed Mar. 18, 1968, Ser. No. 713,831
Int. Cl. G08g 1/01, 1/02
U.S. Cl. 340—37 12 Claims



In order to provide efficient and safe traffic control at a signal intersection, a system is shown for operating the signal sequence according to detection of the approach, presence and passage of vehicles relative to the intersection. Each approach lane to the intersection is provided with traffic detector, such as an induction loop detector for sensing the presence of an automobile within a circumscribed area. Utilizing this detection feature to its fullest extent, logic circuitry is described responsive to the information generated by the loop detectors and operating the signals, for providing directional traffic flow primarily in accordance with the instantaneous, clear space available within the intersection and protection against conflicting signal indications. Additionally, the circuitry in its preferred form is modulized to provide a separate control unit for each direction of traffic, which units may be conveniently interconnected for providing a wide variety of intersection control functions.

3,582,877

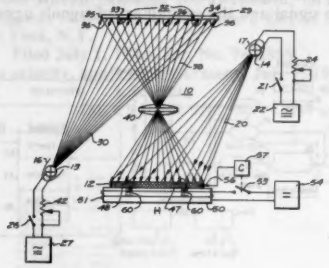
THERMAL MAGNETIC INFORMATION RECORDING

Luc P. Benoit, Los Angeles, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 2, 1969, Ser. No. 821,432
Int. Cl. G01d 15/12
U.S. Cl. 346—74 7 Claims

In information recording methods in which a magnetic recording medium is magnetized by subjection to heating above a transition temperature and subsequent subjection to a cooling cycle in the presence of a magnetic field, the improvement of selecting a pattern of first regions of the recording medium representative of the information, heating the information-representative pattern of first regions to a first temperature above the transition temperature, heating second regions of the recording medium to a second temperature above the first temperature, applying the magnetic field to the recording medium, subjecting the recording medium to the cooling cycle whereby the first regions are magnetized when such first regions cool through and below the transition temperature, removing the magnetic field from

the recording medium before the second regions cool through the transition temperature, and permitting the



second regions to cool through and below the transition temperature.

3,582,878

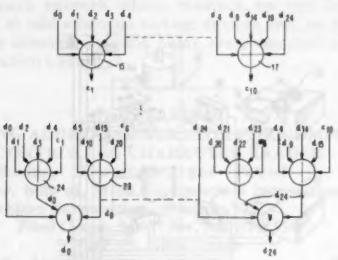
MULTIPLE RANDOM ERROR CORRECTING SYSTEM

Douglas C. Bossen, Wappingers Falls, N.Y.; Robert T. Chien, Urbana, Ill.; Mu-Yue Hsiao, Poughkeepsie, and Frederick F. Sellers, Jr., Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y., by said Bossen, said Hsiao, and said Sellers

Filed Jan. 8, 1969, Ser. No. 789,724

Int. Cl. H04l *1/10;* **G08c** *25/00*

U.S. Cl. 340—146.1 **12 Claims**



The error correcting system is capable of correcting multiple random errors in data messages of k m^2 data bits where m is an integer. The message is encoded by adding $2m$ check bits for each additional error correcting capability. The encoded message after data transfer and storage is decoded by parity checking and threshold logic decision circuits. The parity checking circuits are constructed in modular form. Each additional module adds a further error correcting capability. The outputs from each module form inputs to the threshold logic decision circuit where the error correction is made. Detection of an additional error can be simply achieved by an overall parity circuit.

3,582,879

COMMUNICATION CHANNEL EQUALIZATION SYSTEM AND EQUALIZER

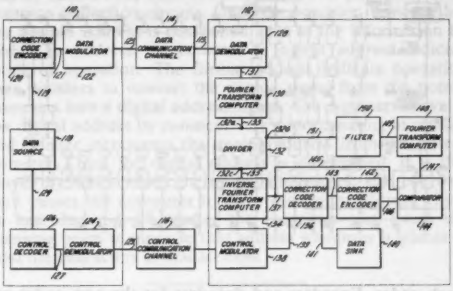
Herbert Sullivan, Fort Lee, N.J., assignor to Computer Mode, Corporation, Fort Lee, N.J.

Filed Apr. 25, 1969, Ser. No. 819,362

Int. Cl. H04b *1/66;* **G01r** *29/00*

U.S. Cl. 340—146.1 **4 Claims**

Compensating distortion of received signals is accomplished in the system. A duplicate of the transmitter error correction code encoder is used to reconstruct the transmitted signals which are then compared with the received signals to generate the equalization control signals. The fourier transform of the received signals is divided by the fourier transform of the equalization control signals to generate the



fourier transform of the equalized signals which is then inverse transformed.

3,582,880

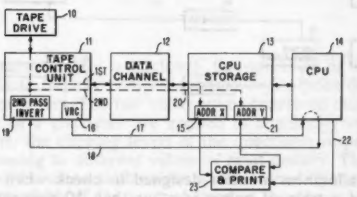
DATA ERROR CORRECTION BY INVERSION STORAGE

William F. Beausoleil, Le Cap, Antibes, France; Richard S. Rohde, Boulder, Colo.; Ronald M. Smith, and Henry Zeiger, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of application Ser. No. 521,055, Jan. 14, 1966, now abandoned. This application Dec. 5, 1969, Ser. No. 878,993

Int. Cl. G06f *11/00;* **G08c** *25/00*

U.S. Cl. 340—146.1 **4 Claims**



A system for sending and receiving data and detecting data errors for correction which includes means for detecting an error in data as it is read from a tape or like device and means for forwarding the data with the error into a further storage point in the system where it is stored for a first time. A second cycle or storage of the data with the error in the storage point is called for, the data with error being arranged to distinguish it from the arrangement of the error data as it existed at the first time at the storage point. The two versions of the same data having error therein are compared to detect and correct the data in error.

3,582,881

BURST-ERROR CORRECTING SYSTEMS

Herbert O. Burton, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

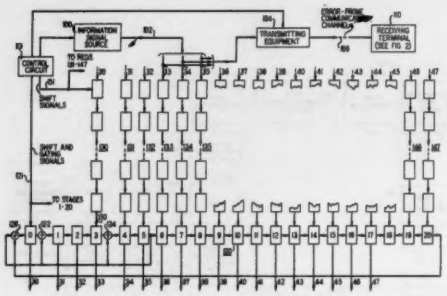
Filed June 9, 1969, Ser. No. 831,643

Int. Cl. G08c *25/00;* **G06f** *11/12*

U.S. Cl. 340—146.1 **6 Claims**

A subclass of Fire codes is utilized to construct a new

general class of asymptotically optimal burst-error-correcting block codes. Encoders and decoders for the new codes are characterized by ease of implementation.



3,582,882

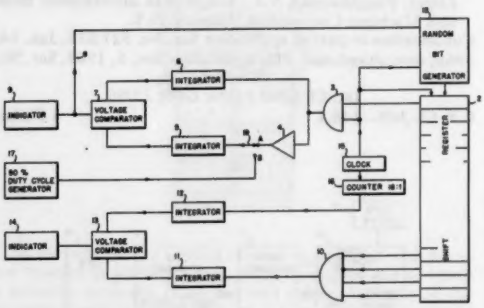
RANDOMNESS MONITOR

George E. Titcomb, Alexandria, Va., and John M. Hovey, Oxon Hill, Md.

Filed Sept. 12, 1968, Ser. No. 759,293

Int. Cl. G06f *7/02*

U.S. Cl. 340—146.2 **6 Claims**



A randomness monitor designed to check when the duty cycle of a train of pulses is other than 50 percent; and to check the frequency with which a predetermined combination of digits occurs in the pulse train wherein each of the two above-mentioned function checkers includes a gating circuit, two integrators, voltage comparator and an indicator.

3,582,883

READING APPARATUS

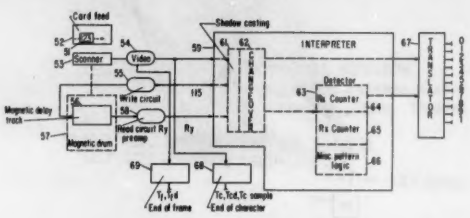
David H. Shepard, Rye, N.Y., and Howard W. Silsby, III, Annandale, Va., assignors to Farrington Electronics, Inc., Springfield, Va., by said Silsby

Filed Oct. 13, 1966, Ser. No. 594,962

Int. Cl. G06k *9/00*

U.S. Cl. 340—146.3 **24 Claims**

Character recognition apparatus wherein portions of the character to be identified are projected to form composite transformed scanning signals. In particular, a logical operation is continuously performed over all scanning lines prior to and including the current scanning line, the logical operation being performed on the entire set of signal elements of the current scanning line and a second set of scanning signals which represent the logical sum of all scanning lines prior to the current scanning line. The projected portions of the character thus constitute certain identifying features, which when combined with other identifying features such as the presence of a character stroke (corresponding to the current scanning line) enable processing circuitry responsive to the transformed scanning signal in the current scanning signal to effect character recognition. Circuitry is also provided for changing the logical operation performed upon the current scan line signal and the second set of signals upon detection of predetermined conditions within the character. In the first mode of operation, the second set of signals is decreased in pulse width to eliminate smudges and the like. During the second mode of operation, the pulse width of the elements of the second set of signals is increased to minimize the effect of breaks in the character strokes.



3,582,884

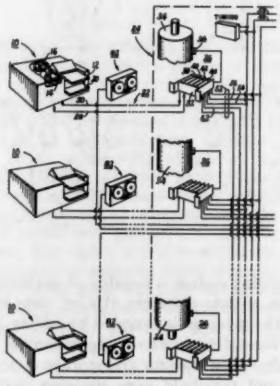
MULTIPLE-SCANNER CHARACTER READING SYSTEM

David H. Shepard, Rye, N.Y., assignor to Cognitronics Corporation, Mount Kisco, N.Y.

Continuation-in-part of application Ser. No. 523,367, Jan. 27, 1966, now abandoned. This application Jan. 30, 1968, Ser. No. 701,670

Int. Cl. G06k *9/10;* **H04n** *1/00*

U.S. Cl. 340—146.3 **17 Claims**



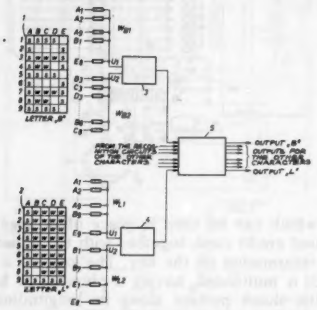
A system comprising a central station having data processing apparatus with a common data buss arrangement interconnecting a data processor with its peripheral devices including a number of incoming data buffers. A plurality of remote desk top scanner units are connected to the central station, each being arranged to receive a document bearing graphic characters and to scan the characters on the document with an optical light beam so as to sweep the character area in a series of adjacent paths. Each remote scanner has means to develop scan signals representing the light reflected from the scanned document and to produce binary code groups indicating the scan distances between certain selected events such as white-to-black transitions. The code groups from each remote scanner are transmitted to a respective data buffer at the central station and subsequently are decoded to reconstruct the original video scan data in a form suitable for deciphering by character recognition means so as to identify the individual characters of the document. The central data processing apparatus, including decoding and character recognition means, operates on a time-sharing basis to service all of the remote units.

3,582,885

AUTOMATIC CHARACTER RECOGNITION METHOD AND ARRANGEMENT

Walter Dietrich, Pforzheim; Christian Ortmann, Morbach, Neckar, and Rudolf Schlupp, Kornwestheim, all of, Germany, assignors to International Standard Elecric Corporation, New York, N.Y.

Filed July 1, 1968, Ser. No. 741,559
Claims priority, application Germany, July 7, 1967, 1,549,902
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 4 Claims



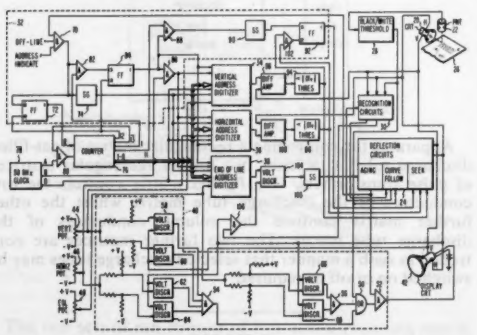
A character recognition arrangement is disclosed in which the character field is scanned in a rastered fashion, and in which the scanning signals corresponding to the "black" value of the individual raster fields, are stored in analogue storage devices, and in which per character there is provided one resistance network whose resistors, on one hand, are connected to said analogue storage devices and, on the other hand, via a common junction point, are connected to a maximum detection circuit.

3,582,886

SCANNING ADDRESS GENERATOR FOR COMPUTER-CONTROLLED CHARACTER READER

William Hardin, Stewartville, and Patrick J. Traglia, Rochester, both of, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1967, Ser. No. 672,550
Int. Cl. G06k 9/04
U.S. Cl. 340—146.3 9 Claims



Great versatility can be achieved by using a computer to control the scanning format of a character reader. To control the format the computer must have accurate addresses as to where to send the scanning beam in the character reader to scan the character fields on a document to be read.

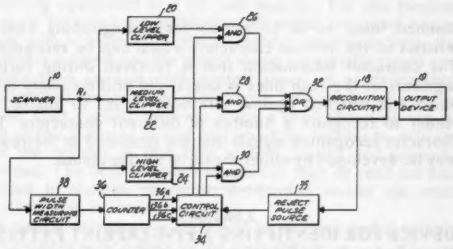
To obtain the accurate addresses, the apparatus in FIG. 1 is built into the character reader. An operator observes on a display cathode-ray tube a facsimile of the document and an address mark showing the position of a scan address. The facsimile is produced by a scanning cathode-ray tube which scans the document to be read. The operator may move the address mark relative to the displayed information from the document by manually adjusting potentiometer. The scanning addresses for the scanning cathode-ray tube and the display cathode-ray tube are identical as they are driven by common deflection circuits. Once the operator observes that the desired address is positioned next to the information he wishes to address, he actuates a format address indicate mode of operation. The format address indicate operation uses digitzers to convert the analog signal from the potentiometers into a digital address signal. The digitizers arrive at the digital address by consecutively approximating in smaller and smaller increments the analog address from the potentiometer. Once the digital address is determined, it is displayed by lamps which the operator observes. The operator then causes the computer to store the digital address which he has observed. Thereafter the computer may cause the scanning beam to move to that address whenever it wishes to read the characters at that address.

3,582,887

ADJUSTABLE CHARACTER READER TO COMPENSATE FOR VARYING PRINT DENSITY

John G. Guthrie, County of Montgomery, Md., assignor to Farrington Electronics, Inc., Springfield, Va.

Filed Mar. 20, 1968, Ser. No. 714,518
Int. Cl. G06k 9/10
U.S. Cl. 340—146.3 6 Claims



A character reader is disclosed, the operation of which is adjustable to thereby compensate for varying print densities of the characters. The raw video pulses generated during the scanning of a character are applied to a plurality of video quantizers, the clipping levels of the quantizers respectively corresponding to different values of print density. The print density of the scanned character is determined by measuring the stroke width of the vertical lines of the characters, the stroke width, in turn, being measured by counting the number of successive scanning frames in which at least one short vertical segment occurs, the length of such segments exceeding some predetermined standard. A plurality of outputs are developed from the counter, the counter outputs respectively corresponding to the plurality of video quantizers whereby the energization of a selected one of the counter outputs will cause the corresponding video quantizer to be actuated and only that quantizer. The recognition circuitry operates only upon that video quantizer output selected by the point density measuring circuit.

3,582,888

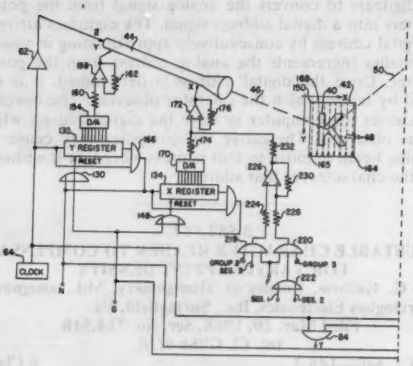
OPTICAL CHARACTER READER EMPLOYING INFORMATION MODULATED SCANNING TECHNIQUES

Dzintars Abuls, Dayton, and Robert A. Phelps, Kettering, both of, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Aug. 7, 1968, Ser. No. 750,854
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 2 Claims

An optical character reader is disclosed which employs a scanning beam to scan a character that is being read and a photocell to sense the variation in light intensity which oc-

curs as the scanning beam traverses the character. The output of the photocell is quantized and is sent to an information analyzer after it is determined that the sensed signal is from the character which is being read and is not the result of noise. The information analyzer receives and analyzes the character information that is received during a number of scan lines, and it employs this information to deflect the scanning beam when it is scanning selected segments of later



scanned lines, so as to search for distinguishing characteristics of the various characters which can be recognized. The character information that is received during various segments of the scan lines is selectively arithmetically combined and weighed against threshold values to enable the reader to recognize a number of different characters. The character recognition signals that are produced in the reader may be developed by either digital or analog means.

3,582,889

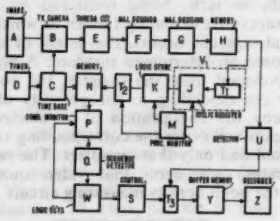
DEVICE FOR IDENTIFYING A FINGERPRINT PATTERN

Pierre Bodez, Paris, France, assignor to C.I.T.-Compagnie Industrielle Des Telecommunications, Paris, France

Continuation-in-part of application Ser. No. 639,570, May 18, 1967, now abandoned. This application Sept. 4, 1969, Ser. No. 855,203

Int. Cl. G06r 9/00

U.S. Cl. 340—146.3E **36 Claims**



A cliche bearing a fingerprint is scanned by a flying spot moving along a network of successive horizontal lines by an industrial television camera. The display signal obtained, corresponding to a section cut off along 15 successive lines, is stored in the form of a logical signal in a data processing storage unit in which a certain number of data processing operations enable the identification, firstly of the end points of a fingerprint line, to determine which of these points are the most characteristic and to calculate the tangent to the fingerprint line at these points.

3,582,890

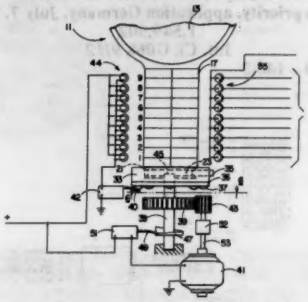
CREDIT KEY

Leslie C. Rivers, 326 E. 229th Place, Wilmington, Calif.

Filed Dec. 1, 1969, Ser. No. 881,066

Int. Cl. G08c 11/00; G09f 3/02

U.S. Cl. 340—149 **10 Claims**



A key which can be used in place of or together with a conventional credit card, together with the apparatus which can read information on the key. The key has a shank portion which is multisided, having a plurality of holes drilled through the shank portion along its longitudinal axis, the holes being normal to the axis. The key is adapted to be inserted in the apparatus which through the utilization of photocells and a light source can determine the location of the hole on each edge of the shank portion.

3,582,891

VISUAL DISPLAY MATRIX

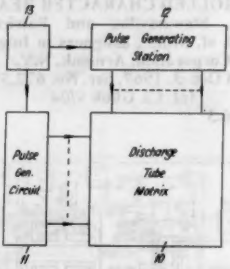
George Richard Hoffman, Sale, England, assignor to Ferranti Limited, Hollinwood, England

Filed Jan. 7, 1969, Ser. No. 789,476

Claims priority, application Great Britain, Jan. 13, 1968, 2029/68

Int. Cl. H04q 1/00, 3/00

U.S. Cl. 340—166 **6 Claims**



Apparatus for controlling a rectangular matrix of gas-filled discharge tubes comprises two further rectangular matrices of pulse transformers. One further matrix controls the row conductors of the discharge tube matrix whilst the other further matrix controls the column conductors of the discharge tube matrix. The two further matrices are controlled in such a manner that selected discharge tubes may be switched on or off as required.

3,582,892

SENSE, STORE AND INTERLOCK MATRIX CIRCUIT FOR A SWITCHING DEVICE

Hans Y. Juliusburger, Putnam Valley, and George R. Stilwell, Jr., West Nyack, both of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

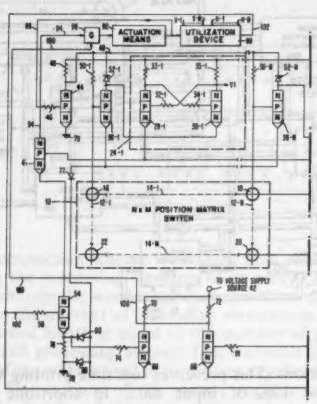
Filed Oct. 29, 1968, Ser. No. 771,583

Int. Cl. H04q 3/00

U.S. Cl. 340—166 **16 Claims**

A circuit is provided which operates in combination with a matrix switch. The circuit senses a switch closure, stores a

pair of output signals representative of the closed switch, cancels the effect of a second switch closure or multiple switch closure during the storage period and resets at the end of the storage period. The circuit includes a plurality of transistor latching means connected to the matrix switch, pairs of which are set by switch closures. Clamping diodes are provided to balance the latching means to prevent spontaneous setting. A switch interlock transistor is included to prevent any subsequent switch closures prior to reset from producing an output signal. A transistor arrangement is also included to cancel the output signals when two or more switches are erroneously closed at the same time. At the end of a selected time period, reset transistors are actuated to reset the circuit to its original state.

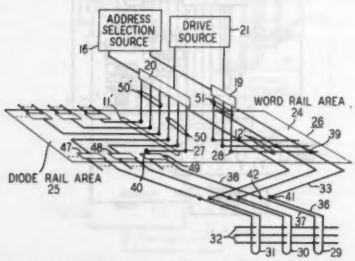


3,582,893

SELECTIVE SWITCHING MATRIX CONFIGURATION HAVING SAME INDUCTANCE AT EACH DRIVING POINT

Sigurd G. Waaben, Princeton, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 29, 1968, Ser. No. 779,809
Int. Cl. H04q *3/00*
U.S. Cl. 340—166 **19 Claims**



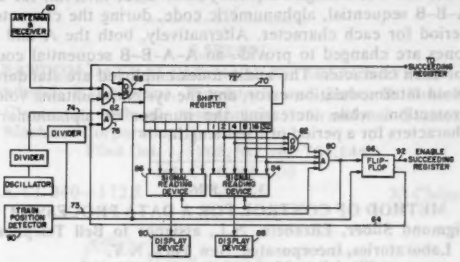
The two sets of rail circuits of a selective switching matrix are arranged in parallel arrays extending colinearly in substantially the same plane. Their cross-point interconnecting circuits are each coupled between points of their respective rail circuits which are spaced from the driving points of such rail circuits by complementary distances totaling a predetermined magnitude which is the same for all of the interconnecting circuits. Such interconnecting circuits are also of equal extent so that equal circuit path lengths are included between any pair of driving points for said first and second sets of rail circuits. Particular matrix configurations utilizing integrated circuit techniques to advantage are also shown.

3,582,894

CODED SIGNAL TRANSMISSION SYSTEM

Robert C. Hoyler, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 20, 1968, Ser. No. 730,572
Int. Cl. G08b *23/00;* **H04q** *9/00*
U.S. Cl. 340—168 **10 Claims**



Coded signal transmission equipment is disclosed wherein a preselected train destination signal comprising a six-bit code signal coded to correspond to anyone out of 0 to 49 and/or a preselected train length signal comprising a six-bit code signal coded to correspond to anyone out of 50 to 59 are sent between a train vehicle and a selected wayside location. These numbers are the result of the particular coding technique employed. In general it is desired to send two coded signals and to separate those signals within the signal receiving equipment in a fail safe manner. For this purpose there is provided a wayside located signal receiving equipment which includes a signal register in which both the destination signal and the length signal are serially stored and shifted by a suitable shift control signal. A predetermined logic circuit arrangement is operative with a selected portion of the shift register to sense when a predetermined one of said signals is stored in said portion of the register to indicate that the register at that time is fully loaded and properly oriented. The desired coded signals can then be read out and utilized to indicate the train destination and/or the train length as may be desired.

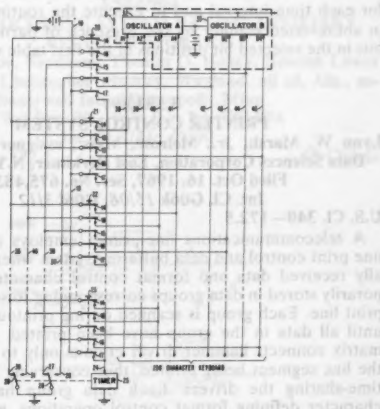
A similar technique is employed to transmit coded vehicle performance signals back to the train vehicle.

3,582,895

ALPHANUMERIC PARALLEL TONE, SEQUENTIAL CHARACTER SYSTEM, METHOD, AND APPARATUS

Paul Abramson, Yorktown Heights, and George R. Stilwell, Jr., West Nyack, both of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,292
Int. Cl. H04q *9/00*
U.S. Cl. 340—171PPF **21 Claims**



An alphanumeric system, method, and apparatus includes a parallel tone transmitter, a parallel tone receiver, each hav-

ing a conventional telephone frequency type of A and B or parallel tone oscillators, and a splitter of tones from the receiver. An A tone will last for an interval long enough to assure protection against response to spurious tones such as voice signals, but may change frequency during the character period. When the A tone is constant during a complete character period, the B tone will not last as long as the A tone, but will change frequency after a set interval, for an A–B–B sequential, alphanumeric code, during the character period for each character. Alternatively, both the A and B tones are changed to provide an A–A–B–B sequential code for each character. The audio tones employed are standard, avoid intermodulation error, and the system maintains voice protection, while increasing the number of alphanumeric characters for a period of fixed length.

3,582,896

METHOD OF CONTROL FOR A DATA PROCESSOR

Sigmund Silber, Elizabeth, N.J., assignor to Bell Telephone Laboratories, Incorporated, New York, N.Y.

Filed Jan. 22, 1965, Ser. No. 427,407

Int. Cl. G06f *9/12*

U.S. Cl. 340—172.5 **9 Claims**

CALL STORE TRANSFER TABLE FOR TIMETABLE PROGRAM

P0	ADDRESS OF FIRST INSTRUCTION IN SUBROUTINE A
P1	ADDRESS OF FIRST INSTRUCTION IN SUBROUTINE B
P2	
P3	
P4	
P5	
P6	ADDRESS OF FIRST INSTRUCTION IN SUBROUTINE C
P7	
P8	
P9	ADDRESS OF FIRST INSTRUCTION IN SUBROUTINE D
P10	
P11	
P12	
P13	
P14	
P15	ADDRESS OF FIRST INSTRUCTION IN SUBROUTINE E
P16	
P17	
P18	
P19	
P20	
P21	
P22	ADDRESS OF FIRST INSTRUCTION IN SUBROUTINE F

A stored program data processor is disclosed in which certain subroutines must be executed during predetermined real time intervals. These times are designated by clock controlled interrupt of the normal program processing sequence. A first table is provided in storage in which there are a number of words equal to the number of different real time intervals. Each of these words has a number of bit positions equal to the number of possible subroutines which could be called for in that interval. Each bit is correlated to a word in a second table which word is the address of one of the subroutines. Instructions are provided for operating the data processor to consult the word in the first table appropriate for each time interval and to execute the routines indicated in abbreviated manner by the presence of particular valued bits in the selected bit positions of the first table word.

3,582,897

PRINTER CONTROL SYSTEM

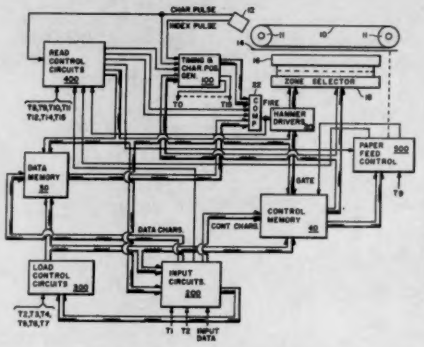
Lynn W. Marsh, Jr., Melrose, Mass., assignor to Mohawk Data Sciences Corporation, East Herkimer, N.Y.

Filed Oct. 16, 1967, Ser. No. 675,483

Int. Cl. G06k *15/08*; G06f *3/12*

U.S. Cl. 340—172.5 **11 Claims**

A telecommunications line-printer employs a segmented line print control and data buffering system wherein the serially received data and format control characters are temporarily stored in data groups corresponding to segments of a print line. Each group is scanned during printout operations until all data in the group have been printed. A switching matrix connects hammer driver circuits only to hammers in the line segment being printed, thus conserving hardware by time-sharing the drivers. Each data group has a control character defining format control operations, which operations are executed before printing of the group begins. In ordinary circumstances, each format control character occurring at the input opens a new data group to receive the next data characters, regardless of whether the previous group was completely filled. However, in "short line" situations memory is conserved by not closing the group until it is full and the rate of extraction of data from the memory is increased by temporarily suspending the performance of format operations. This preserves real time printing while insuring against loss of input data. In short-line situations, received format control characters are ignored by the format control means and instead trigger the printing of a special character indicating that a format operation was deleted.



3,582,898

PATTERN RECOGNITION DEVICES

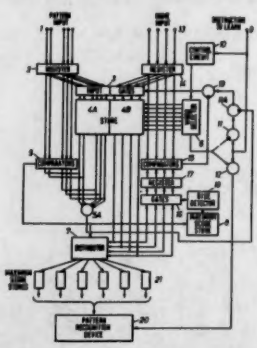
Christopher Archibald Gordon Le May, Isleworth, England, assignor to Electric & Musical Industries Limited, Hayes, England

Filed Dec. 21, 1967, Ser. No. 692,522

Claims priority, application Great Britain, Dec. 30, 1966, 58,310/66

Int. Cl. G06f *7/00*

U.S. Cl. 340—172.5 **5 Claims**



The present invention relates to pattern recognition devices, that is to say devices, which in response to an applied representation of an unknown pattern, for example, in the form of a plurality of binary digits, produce an output signal representing the identity of a known pattern most clearly resembling the unknown pattern.

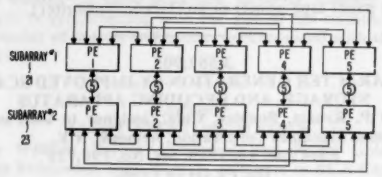
One difficulty which is encountered in pattern recognition arises from the fact that the representation may be derived from, for example, printed characters or other patterns which have suffered translation, rotation or even change of size in relation to other such characters, with the result that the device has to be capable of recognizing the same character or pattern with different values of such parameters and this can lead to an undesirable increase in the storage required in the pattern recognition device.

3,582,899

METHOD AND APPARATUS FOR ROUTING DATA AMONG PROCESSING ELEMENTS OF AN ARRAY COMPUTER

Carl F. Semmelhaack, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 21, 1968, Ser. No. 714,907
Int. Cl. G06f 3/04
U.S. Cl. 340—172.5 3 Claims



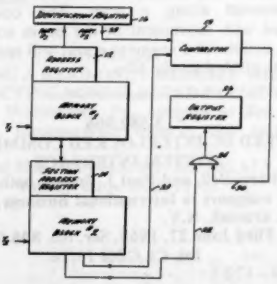
An interconnection scheme for routing data word information among the processing elements of an array computer is described wherein the word length is larger than, equal to, or smaller than the number of processing elements in the array. When the word length is equal to the number of processing elements, each processing element first transmits all but one of the bits of the word stored in its routing register to the corresponding bit positions of the routing register of the correspondingly numbered processing elements, one bit per processing element. Next the contents of the routing registers of all the processing elements are shifted by the routing amount. In the last step, the first step is repeated. In situations in which the word length is smaller than the number of processing elements hardware is added to some of the processing elements or the processing elements may be grouped into a plurality of subarrays. If the word length is larger than the number of processing elements the bits are grouped so that the number of groups is equal to the number of processing elements.

3,582,900

INFORMATION PROCESSING MACHINE

Robert N. Goldman, Pacific Palisades, Calif., assignor to Telecredit, Inc.

Filed May 5, 1969, Ser. No. 821,869
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 5 Claims



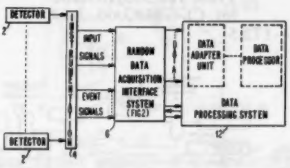
An information processing machine is disclosed, specifically for providing information, e.g. status indications, for a large number of subjects. Electrical signals which are representative of various levels of status are registered in locations of a memory which is divided into two separate blocks. An encoder provides electrical signals that are representative of a subject's identification, e.g. 12 binary-coded decimal digits. Certain digits of the representation are transferred to a first block of the memory which responsively supplies signals that identify a section or group of specific locations in a second block of the memory. Signals from those specific locations are then compared with the signals representative of the remaining digits of the subjects identification. Coincidence in such a comparison is detected to indicate a specific location in the second block of memory, which also registers the subject's status. Means for manifesting the subject's status is incorporated in the system to receive the status signals. Apparatus is also incorporated to alter a subject's status and to record a fresh subject's identification along with signals representative of status.

3,582,901

RANDOM DATA ACQUISITION INTERFACE SYSTEM

Frederick P. Cochrane, Woodstock, and James D. Russell, Claverack, both of, assignors to International Business Machines Corporation, Armonk

Filed Oct. 1, 1968, Ser. No. 764,144
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 33 Claims



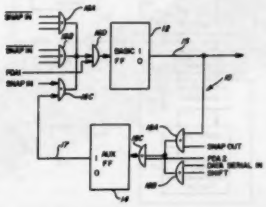
A data acquisition interface system for translating real-time randomly occurring complex input signals into data processing usable form for transmission to an online data processing system. The system includes a plurality of interchangeable data acquisition components of the monitor register, scaler/timer and analogue to digital converter type which are activated by external means for gathering data, counting inputs, measuring time and making analogue to digital conversions and an interface control unit for organizing the data transfer from the components to the data processing system. The occurrence of an input signal, the time coincidence of two or more input signals or the presence and absence of input signals or the like are termed events. In response to the occurrence of an event, the interface control unit initiates a sequential component data transfer from the components associated with the event preceded by a word identifying the event. Events are processed in numerical sequence, but processing may be selectively modified to permit processing in priority sequence. Events may be programmed to exclude other events which share a common component.

3,582,902

DATA PROCESSING SYSTEM HAVING AUXILIARY REGISTER STORAGE

Allen C. Hirtle, Needham; Thomas O. Holtey, Newton Lower Falls, and Christopher Plumley, Wayland, all of, Ala., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1968, Ser. No. 787,874
Int. Cl. G11c 19/00
U.S. Cl. 340—172.5 28 Claims



In electronic data processing apparatus wherein each basic storage element comprising the conventional working re-

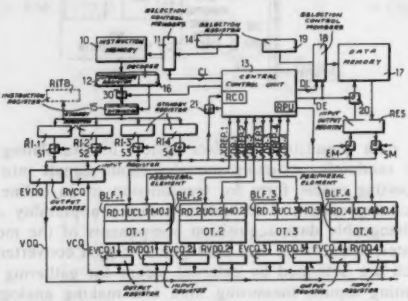
gisters of the data processing apparatus is supplemented by an auxiliary storage element of similar construction; the auxiliary storage element being capable of loading, or being selectively loaded with information in its associated basic storage element. Also provided are means for logically interconnecting the auxiliary storage elements to form a single shift register; the last named means including means for periodically shifting the contents of the extended shift register to other portions of the data processing apparatus for storage and/or analysis.

3,582,903

DEVICES FOR TRANSFERRING INFORMATION BETWEEN A CENTRAL UNIT AND PERIPHERAL ELEMENTS

Henri Louis Verdier, Paris, France, assignor to Societe Industrielle Bull-General Electric (Societe Anonyme), Paris, France

Filed Nov. 1, 1968, Ser. No.
Claims priority, application France, Nov. 16, 1967, Jan. 24, 1968, 128,535;137,206
Int. Cl. G06f *3/00, 3/04*
U.S. Cl. 340—172.5 **15 Claims**



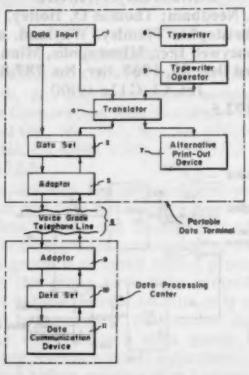
The invention concerns a data processing system comprising a central unit and peripheral units of different types connected to the said central unit through two transfer channels, and wherein each peripheral element is provided with a functional connecting system which enables it to be connected to the central unit without any necessity to modify the circuits of the central unit in order to adapt it to the operation of this element.

3,582,904

PORTABLE DATA TERMINAL

Rowland Bradwein, Newtown, Conn., assignor to Sine Qua Non, Inc., Newton, Conn.

Filed Feb. 27, 1969, Ser. No. 802,896
Int. Cl. G06f *3/00, 3/04, 3/10*
U.S. Cl. 340—172.5 **10 Claims**



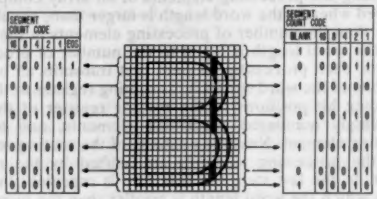
A data terminal comprising readily portable components is adapted to be interconnected by voice grade telephone lines to a remotely located computer or other data processing equipment. The data terminal comprises data input means (e.g., a magnetic tape reader or a manually operated keyboard) for generating a coded digital signal, a data set for converting the digital signal of the data input means to a coded modulated signal that can be transmitted over a telephone line and for converting a modulated signal received from said telephone line into a coded digital signal, and translator means for converting digital signals received from the data input means and from the data set into coded electrical signals capable of operating a data printout device (e.g., a paper tape printer or an electric typewriter).

3,582,905

CHARACTER GENERATION BY IMPROVED SCAN, STORAGE, AND DECODING APPARATUS

Harold P. Krantz, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 13, 1969, Ser. No. 790,711
Int. Cl. G11b *13/00*
U.S. Cl. 340—172.5 **8 Claims**



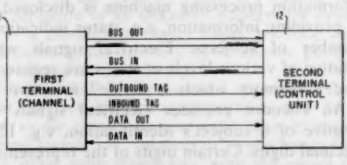
Characters are generated in a photoprinter by storing and decoding black and white segments for a raster scan. The raster scan is accomplished by a cathode ray tube. Light from the screen of the tube is focused onto photographic film so that the cathode-ray tube by raster scan can print a character on the film. The cathode-ray beam is controlled in two states of intensity so as to print black on white or white on black characters as desired. A given scan in the raster scan is thus broken into a series of blank or unblank segments for the intensity control of the cathode-ray tube. In the apparatus herein, these segments are defined by segment counts which indicate the length of each segment in a scan. A scan is made up of a sequence of blank and unblank segment counts. These segment counts are loaded into a series of counters. The counters are sequentially counted out as the cathode ray beam is moved along a scan. The counting out is synchronized with movement of the beam so that the time required to count out a segment count will specify the length of a segment printed on the film.

3,582,906

HIGH-SPEED DC INTERLOCKED COMMUNICATION SYSTEM INTERFACE

William F. Beausoleil, and Paul J. Brown, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1969, Ser. No. 838,052
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **15 Claims**



A communication system which connects input/output (I/O) devices of different data rates with a data processing system. Transfer of the first byte of data to the data

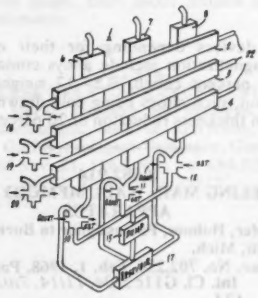
processing system from an I/O device is synchronized with the rise of an inbound tag from the I/O device. Receipt of the first byte by the data processing system is signalled by raising the outbound tag, following which the device drops the inbound tag. Transfer of the second byte from the I/O device is synchronized with the rise of a data in tag. Receipt of the second byte is signalled by raising the data out tag. The outbound tag is dropped after the inbound tag has dropped. The data out tag is dropped after the data in tag has dropped.

Transfer of data *to* the device *from* the data processing system utilizes the same sequence, however, transfer of the first byte is synchronized with the rise of the outbound tag and transfer of the second byte is synchronized with the rise of data out.

3,582,907
LIGHT APERTURE MATRIX

George William Taylor, Princeton, and Philip Goldstein, North Brunswick, both of, N.J., assignors to RCA Corporation

Filed May 14, 1968, Ser. No. 729,066
Int. Cl. G11c *13/04*
U.S. Cl. 340—173LM **18 Claims**

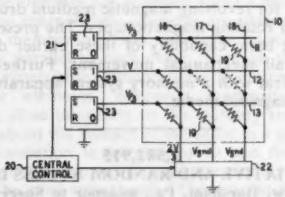


A matrix of light controlling intersections having transparent X and Y fluid channels with fluid amplifiers controlling the flow of fluid in the channels. The fluid may be either opaque to control the transmission of incident traversing light at the matrix intersections of simple X and Y fluid conduits of transparent material to control the light transmission by affecting the interface between a prism face and a fluid surface.

3,582,908
WRITING A READ-ONLY MEMORY WHILE PROTECTING NONSELECTED ELEMENTS

James T. Koo, Walnutport, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Mar. 10, 1969, Ser. No. 805,673
Int. Cl. G11c *7/02, 11/48*
U.S. Cl. 340—173 **4 Claims**

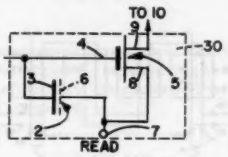


A resistive read-only memory is manufactured initially with all of its resistor cross-point connections intact. Thereafter information is written into the memory by destroying selected resistor cross-point connections by applying a voltage across each row and column circuit combination uniquely defining one of the selected cross-points The voltage drives destructive current through the selected cross-points but nonselected resistor cross-points are preserved intact by simultaneously biasing nonselected row and column circuits to respective lower voltage levels. Apparatus is also indicated for applying the aforementioned voltages.

3,582,909
RATIOLESS MEMORY CIRCUIT USING CONDITIONALLY SWITCHED CAPACITOR

Robert K. Booher, Mission Viejo, Calif., assignor to North American Rockwell Corporation

Filed Mar. 7, 1969, Ser. No. 805,306
Int. Cl. G11c *11/40*
U.S. Cl. 340—173R **13 Claims**



The memory circuit includes a capacitor which has its capacitance conditionally switched between a substrate and an input electrode as a function of the potential on its fixed plate.

If a potential representing a logic one state is applied to the fixed plate during a write period of the memory cycle, the capacitance is switched to the input electrode. During a read period of the memory cycle, the potential on the fixed plate is boosted by an amount proportional to the potential applied to the input electrode of the capacitor. The potential on the fixed plate is used on the gate electrode of a field effect device to drive the output electrode to the potential appearing on the input electrode, assuming that the boosted potential of the fixed plate is at least one threshold greater than the potential applied to the input electrode. The output voltage represents the logic state of the stored information.

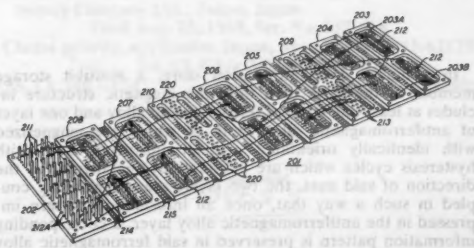
If a logic zero state had been stored, the capacitance would have remained connected to the substrate so that the voltage on the input electrode of the capacitance would have had no effect on the circuit.

The circuit uses a second capacitor, regenerated during each read cycle, to regenerate the charge on the conditionally switched capacitor as well as the charge on the inherent capacitance connected to the conditionally switched capacitor. As a result, a nonvolatile memory is provided.

3,582,910
MOUNTING ARRANGEMENT FOR FERRITE CORES

John A. Drager, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

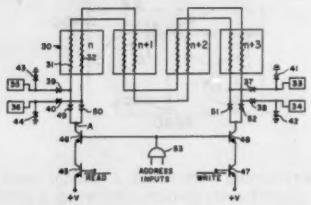
Filed Dec. 28, 1967, Ser. No. 694,330
Int. Cl. G11c *5/04, 5/08, 5/12*
U.S. Cl. 340—174 **1 Claim**



In a mounting arrangement for multiapertured ferrite core devices either single cores or groups of cores are mounted in

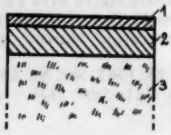
the cavities of framework members. Core windings are suitably interconnected or terminated on similar framework members that also interconnect the core mounting frameworks. A group of framework members is held together by a superimposed tape or nonconducting mesh and the assembly is then folded in accordion fashion to form a compact unitary module.

3,582,911
CORE MEMORY SELECTION MATRIX
John P. Smith, Littleton, Colo., assignor to Ferroxcube Corporation, Saugerties, N.Y.
Filed Dec. 4, 1968, Ser. No. 781,023
Int. Cl. G11c *7/00, 5/02, 11/06*
U.S. Cl. 340—174 **5 Claims**



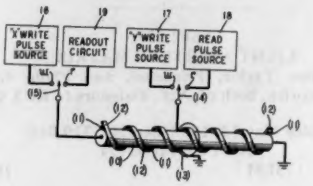
A selection circuit for a magnetic core memory-matrix array is provided with a current source for a reading or writing operation coupled directly to a group of storage lines at one end, the other end of each storage line being connected to a plurality of individual transistor switches which are addressable for a particular storage line, and a further switch, responsive to a logical read or write instruction, is provided for triggering groups of transistor line switches.

3,582,912
THIN FILM MAGNETIC INFORMATION STORES
Jean Valin, Le Roi, and Jean-Claude Bruyere, Sayssinet, both of, France, assignors to Centre National De La Recherche Scientifique, Paris, France and Compagnie Internationale Pour L'Informatique, Louveciennes, France
Filed Mar. 8, 1968, Ser. No. 711,806
Claims priority, application France, Mar. 29, 1967, 100738
Int. Cl. B32b *15/18;* **G11c** *11/14*
U.S. Cl. 340—174 **30 Claims**



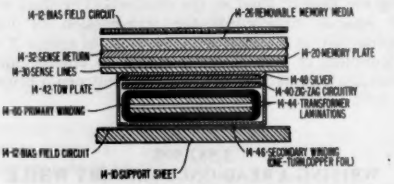
In a binary data information store, a multibit storage member in the form of a thin film magnetic structure includes at least one layer of ferromagnetic alloy and one layer of antiferromagnetic alloy, both of which are magnetized with identically orientated uniaxial anisotropy axes with hysteresis cycles which are substantially rectangular in the direction of said axes, the two layers are magnetically coupled in such a way that, once an information pattern impressed in the antiferromagnetic alloy layer, a corresponding information pattern is preserved in said ferromagnetic alloy layer irrespective of parasitic fields tending to variations of magnetization conditions, such for instance as any demagnetizing fields, and of temporarily localized variations of magnetization which may occur during readout operations.

3,582,913
MAGNETIC ALLOY MATERIAL AND DEVICE UTILIZING SAME
Gilbert Y. Chin, New Providence, N.J.; Donald Jaffe, Emmaus, Pa., and Ethan A. Nesbitt, Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.
Division of Ser. No. 665,340, Sept. 5, 1967, Pat. No. 3,511,639.
Filed Oct. 6, 1969, Ser. No. 871,130
Int. Cl. G11c *11/12*
U.S. Cl. 340—174 **5 Claims**



Magnetic devices depending for their operation upon remanent magnetization include alloys containing from 75—95 weight percent cobalt, 0.5—17 weight percent gold, remainder iron, such alloys being cold drawn so as to result in a minimum thickness reduction of 20 percent.

3,582,914
TRAVELING MAIN WALL MEMORY SYSTEM APPARATUS
Philip E. Shafer, Holmes, Pa., assignor to Burroughs Corporation, Detroit, Mich.
Division of Ser. No. 702,254, Feb. 1, 1968, Pat. No. 3,493,946.
Int. Cl. G11c *5/04, 11/14, 7/02*
U.S. Cl. 340—174 **6 Claims**

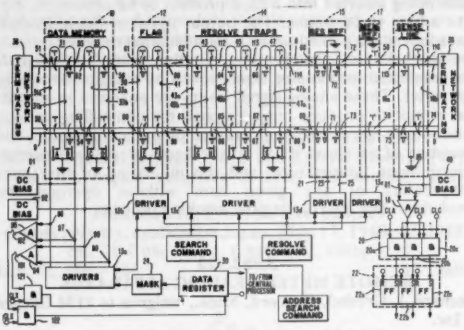


The present application discloses a memory system apparatus such as might be utilized to store binary digital information in a digital processing system. The apparatus includes means for utilizing the travel of a magnetic domain wall through a magnetic medium to thereby provide a memory replacement for revolving magnetic medium drums and discs as well as for rotating magnetic tapes. The present apparatus provides the basic capability of these earlier devices while eliminating all mechanical movement. Further, it accomplishes this feat with a memory system apparatus which has removable magnetic media.

3,582,915
ASSOCIATIVE AND RANDOM ACCESS DEVICE
Woo F. Chow, Horsham, Pa., assignor to Sperry Rand Corporation, New York, N.Y.
Continuation of application Ser. No. 503,363, Oct. 23, 1965, now abandoned. This application Oct. 16, 1969, Ser. No. 867,435
Int. Cl. G11c *15/00, 11/14*
U.S. Cl. 340—174 **16 Claims**

There is disclosed an all magnetic memory arrangement

which operates in a search memory mode or alternatively in



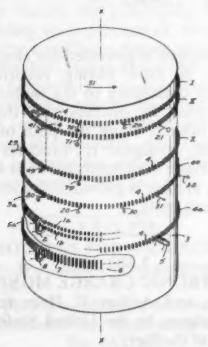
a random access mode. Each mode utilizes essentially the same memory elements.

3,582,916

PULSE DELAY ARRANGEMENT

Hans Joachim Stock, Freiburg Im Breisgau, and Gernot Gottschall, Boeblingen, both of, Germany, assignors to Franz Morat GmbH, Stuttgart-Vaihingen, Germany

Filed Nov. 21, 1967, Ser. No. 684,853
Int. Cl. G11b *5/48, 27/12*
U.S. Cl. 340—174.1 **7 Claims**



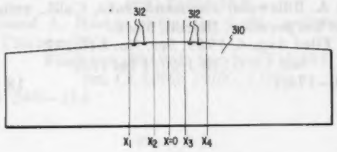
A pulse or signal delay arrangement in which a number of magnetizable elements are arranged about a rotating member or drum. The magnetizable elements are situated on the surface of the member or drum and form tracks or channels substantially parallel to each other. Through their magnetic state, the magnetizable elements serve as information storage or memory elements. Magnetic read-write heads are mounted in close proximity to the memory tracks, and are distributed about the surface of the drum in a predetermined pattern. Information is transmitted to and from the magnetizable memory element through the medium of magnetic pulses via the read-write heads. The magnetizable memory elements may be constructed integral with the memory member or drum, or may be of individual construction secured to the surface of the drum. When the memory elements are of separate or individual construction, the drum may be made of nonmagnetic material. The magnetizable memory elements may be made of a two-part construction or may be designed of a single part.

3,582,917

MAGNETIC HEAD HAVING A CONTINUOUSLY VARIABLE RADIUS OF CURVATURE

Friedrich R. Hertrich, and Sanford Platter, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1968, Ser. No. 783,696
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1 **6 Claims**



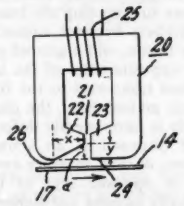
A magnetic head employing a fluid bearing between the head operating surface and a tape moving thereover, with the head surface configuration characterized by a continuously varying radius of curvature.

3,582,918

MAGNETIC HEAD WITH DISSIMILAR POLE PIECES

Jerome J. Tiemann, Schenectady, N.Y., assignor to General Electric Company

Filed Jan. 12, 1968, Ser. No. 697,400
Int. Cl. G11b *5/02, 5/44*
U.S. Cl. 340—174.1F **11 Claims**



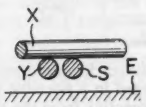
The corner of a magnetic recording head at one edge of the gap therein is modified by being set back, rounded off, etc., to produce a slowly varying response when a magnetic flux reversal in a magnetic recording medium moving in relation to the head passes the modified corner. A fast response is thus produced only when a flux reversal passes the corner at the other gap edge, obviating nulls in frequency response and yielding the benefits of a large gap without sacrificing resolution. Linear processing of waveforms produced by the head provides a sharp output pulse in response to each passing flux reversal.

3,582,919

MAGNETIC-CORE MEMORY MATRIX THREADING SYSTEM

Joichiro Ezaki, Funabashi-shi, Japan, assignor to TDK Electronics Company Ltd., Tokyo, Japan

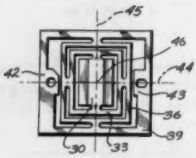
Filed Aug. 25, 1969, Ser. No. 852,668
Claims priority, application Japan, Aug. 30, 1968, 43/62175
Int. Cl. G11c *5/02, 11/06*
U.S. Cl. 340—174 **1 Claim**



A magnetic core memory matrix threading system for preventing noise due to induction or induced voltage. A

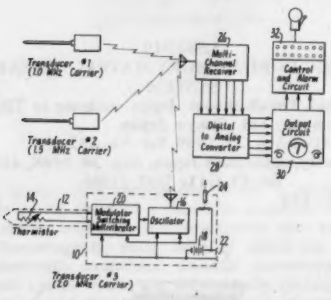
sense winding is arranged to be in the same plane and in parallel with a drive winding. Another drive winding is provided which is not in the same plane and is not in parallel with the parallel sense and drive windings. The parallel sense and drive windings are located between the other drive winding and the surface of a ground element.

3,582,920
SUPPORT DEVICE FOR MAGNETIC HEAD
Shahbuddin A. Billawala, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.
Filed Aug. 4, 1969, Ser. No. 847,277
Int. Cl. G11b *5/60; F16f 1/02*
U.S. Cl. 340—174.1 **18 Claims**



A support device for floating a magnetic head assembly on a fluid atmosphere is asymmetrically dimensioned so it assumes a positive angle of approach on application of a normal force at its center point by an actuating mechanism. The support device is a substantially flat, thin body structure of elastic material having perforations therein positioned and shaped to form a platform, an inner frame surrounding the platform, an outer frame surrounding the inner frame, a first pair of connecting members between opposite sides of the platform and the inner frame, and a second pair of connecting members between opposite sides of the inner frame and the outer frame disposed transverse to the first pair of connecting members. In one embodiment, the platform that supports the head assembly is permanently deformed to lie in a plane forward of and disposed at an acute angle to the remainder of the support device. In other embodiments, the length and/or width of opposite legs of the frames are unequal, thereby normally causing unbalanced deflection of the support device responsive to the actuating mechanism.

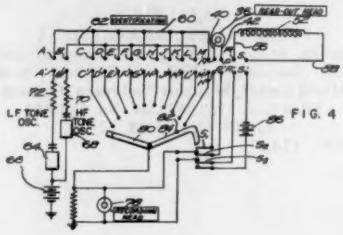
3,582,921
TEMPERATURE TRANSDUCER AND TELEMETRY SYSTEM
Charles R. Krieger, 1639 East Kingsley Ave., Pomona, Calif.
Filed Aug. 6, 1968, Ser. No. 750,541
Int. Cl. G08c *15/06, 19/18*
U.S. Cl. 340—182 **14 Claims**



A temperature transducer having a small battery powered oscillator circuit packaged in a portable housing with a relatively slender probe projecting from the housing for insertion into food products or the like. A temperature responsive element is mounted at the tip of the probe and is coupled to a modulation switching circuit inside the housing for periodically activating the oscillator for a time duration which is proportional to the temperature of the temperature responsive element.

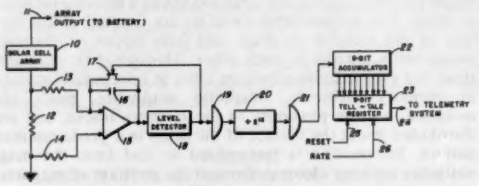
A plurality of such transducers are used in the telemetry system, each having a different frequency of oscillation, and each being inserted into a food product to be processed, e.g. into a ham to be smoke. The output signal of the individual transducers are picked up by a multichannel receiver outside the smokehouse, and the time duration modulation signals are translated into analog signal levels by a digital-to-analog converter. These analog signal levers are analyzed in an output circuit to produce output signals for controlling various functions, such as, the temperature of the smokehouse, the sounding of an alarm if any of the hams exceed a predetermined inner temperature, and the indicating of the inner temperature of any given ham without opening the smokehouse or interrupting the smoking process.

3,582,922
REMOTE METER-READING APPARATUS
Leonard J. Greshel, Concord, Mass., assignor to ITM Integer Inc.
Filed May 20, 1968, Ser. No. 740,794
Continuation of Ser. No. 455,914, May 14, 1965, abandoned, and continuation of Ser. No. 689,213 Nov. 6, 1967, abandoned
Int. Cl. G08c *19/16, 9/04*
U.S. Cl. 340—204 **6 Claims**



A telemetering device is provided for reading meters from remote locations. A tape having recorded digital data thereon is drivingly connected to the meter to be advanced past a reference point by operation of the meter. A tape reading head is disposed along the path of the tape at the reference point and, on signal, reciprocates a short distance along the tape to make a nonambiguous reading of the tape position. A coding system is provided for identifying each of a number of different units.

3,582,923
ELECTRONIC CHARGE MONITOR
Daniel P. Peletier, and Arthur F. Hogrefe, both of Silver Spring, Md., assignor to the United States as represented by the Secretary of the Navy
Filed Nov. 12, 1968, Ser. No. 774,735
Int. Cl. G08c *15/12, 19/28*
U.S. Cl. 340—204 **9 Claims**



The charging current supplied by a satellite solar cell array is monitored to produce a voltage signal proportional to the charging current. This voltage signal is then applied to a finite time integrator circuit whose output is, in turn, applied to a level detector. The level detector functions to clear the

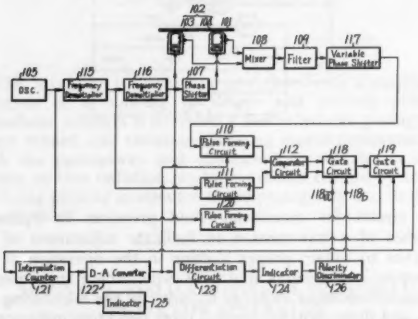
integrator circuit and generate an output pulse each time the integrated signal indicates that a predetermined amount of electrical charge has been supplied to the satellite battery by the solar array. The output pulses from the level detector circuit are first scaled down so that the satellite's telemetry system handles no more data than is necessary to indicate accurately the status of the satellite's power system and these scaled-down pulses are then interfaced into the satellite's telemetry system for transmission to a remote receiving station.

3,582,924

DISPLACEMENT MEASURING INSTRUMENT

Saburo Uemura, Kanagawa-ken, and Kiyoshi Himuro, Tokyo, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 13, 1969, Ser. No. 824,229
Claims priority, application Japan, May 17, 1968, 43/33193
Int. Cl. G08c *19/16*; **G01b** *7/02*; **G01p** *3/50*
U.S. Cl. 340—206 **17 Claims**



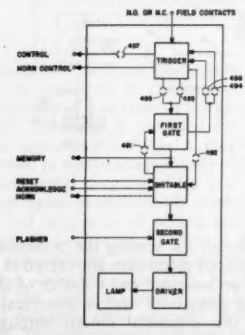
A displacement measuring instrument comprising displacement transducer means for generating a phase-modulated signal corresponding to displacement, means for supplying a carrier signal to the transducer means, means for producing a pulse width modulation signal of a width corresponding to a phase difference between the phase-modulated signal and the carrier signal, means for generating a signal of a frequency *n* times that of the carrier signal, *n* being an integer, and means for producing an interpolation signal corresponding to a phase difference between the signal of the frequency *n* times that of the carrier signal and the pulse width modulation signal.

3,582,925

INDICATOR MODULES FOR ANNUNCIATOR SYSTEMS

Lester H. Porter, Jr., Dallas, Tex., assignor to Beta Corporation, Dallas, Tex.

Continuation-in-part of application Ser. No. 588,847, Oct. 24, 1966, now abandoned. This application Aug. 8, 1967, Ser. No. 662,268
Int. Cl. G08b *29/00*
U.S. Cl. 340—213.1 **9 Claims**



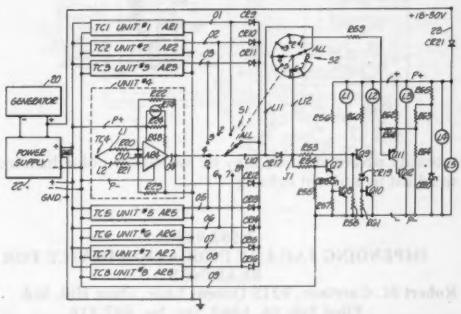
This application discloses annunciator systems for monitoring operation of processes and equipment and indicating and occurrence of abnormal conditions, these systems using an indicator module which is adaptable for a wide variety of types of indicator sequences including first-out, latching or nonlatching, ringback, sequence readout, and others. The indicator module comprises a combination including gates and bistable devices to provide these functions.

3,582,926

TEMPERATURE INDICATOR FOR AIRCRAFT BRAKES AND THE LIKE

Mohammed A. Hassan, Glendale, Calif., assignor to Crane Co., Chicago, Ill.

Filed Apr. 8, 1968, Ser. No. 719,491
Int. Cl. G08b *29/00*, *17/00*
U.S. Cl. 340—214 **21 Claims**



A temperature indicating and warning system utilizing thermocouple heat sensors connected through cabling to individual amplifying and readout facilities at a remote location and equipped with means for compensating for changes in the ambient temperature at the cold junction reference for the several heat sensors. In a typical application the heat sensors are used to sense temperature conditions at each braked wheel of aircraft landing gear and connected to readout facilities in the pilot's compartment. These facilities include means providing distinctive signals when the temperature at any braked wheel exceeds different selected levels and includes simple manually operated means enabling a crew member to determine which one or ones of the wheels are affected. The system also includes means for checking it for operativeness prior to use.

3,582,927

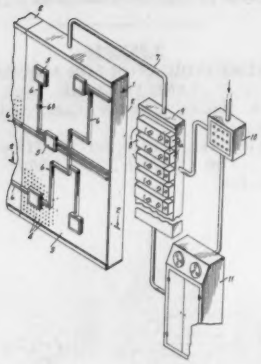
POWER NETWORK DISPLAY PANELS AND CONTROLS

George Primavera, Yorktown Heights; Klaus Spiegel, Purdys; James Orr, Brewster, and Werner Neuburger, West Nyack, all of, N.Y., assignors to Lester Associates, Inc., Thornwood, N.Y.

Filed June 30, 1969, Ser. No. 837,634
Int. Cl. G08b *25/00*
U.S. Cl. 340—225 **16 Claims**

A diagram or display board for electrical power networks, comprising indicator modules, in the form of boxlike enclosures containing illuminating lamps and having removable indicator plates on the front, which modules are each mounted on the front of a perforated support panel by two bolts, one insulated and conducting electrical power to the lamps, and the other connected to the panel which acts as common or ground. A nonglare surface is produced on the indicator plates which may be fitted with clips for attachment to the boxes or slidably held therein. The plates and the lamps may be of different colors to distinguish between the various components and temporary changes in system conditions are indicated by flashing the lamps at different frequencies in ac-

cordance with the urgency of the attention required. The board is controlled both manually and by computer and the



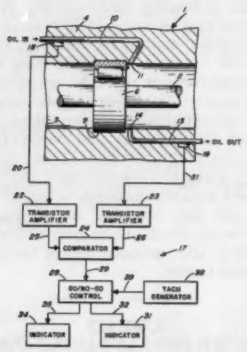
intensity of illumination may be varied for color balance or to adjust to ambient lighting.

3,582,928

IMPENDING FAILURE INDICATION DEVICE FOR BEARINGS

Robert M. Gaertner, 9315 Queens Lane, Oxon Hill, Md.

Filed July 16, 1969, Ser. No. 842,316
Int. Cl. G08b *21/00*
U.S. Cl. 340—231 **9 Claims**



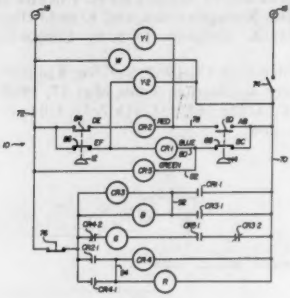
An engine-bearing monitoring device having a pair of thermocouples connected across the bearing and a comparator connected to the thermocouples through amplifiers for measuring the temperature differential across the bearing. A threshold control is connected to the comparator and indicators in turn are connected to the control which indicators are operated upon the temperature differential reaching a threshold amount whereby to indicate that the bearing is not operating normally or being lubricated properly and that complete failure thereof is impending. The tachometer generator of the engine is connected to the threshold control to vary the threshold in accordance with the speed of the engine shaft.

3,582,929

TRANSMISSION CLUTCH FLUID PRESSURE-INDICATING SYSTEM

William R. Dollase, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 3, 1969, Ser. No. 813,045
Int. Cl. G08b *5/00;* **F16d** *11/00;* **F16b** *3/44*
U.S. Cl. 340—236 **9 Claims**



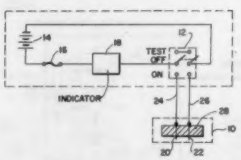
A circuit for monitoring fluid pressures in hydraulic clutches of a transmission to facilitate adjustment of the clutches to obtain proper shifting in the operation of the transmission. Pressures in at least two clutches are sensed by pressure-responsive switches included in the monitoring circuit, and these switches control three condition indicators of the circuit. Actuation of a first condition indicator shows that a proper shift has been made, and the first indicator is actuated only when both pressures switches are switching at substantially the same time. When the pressure switches switch sequentially rather than at the same time, one of the other two indicators is actuated, the particular indicator depending on the sequence in which the pressure switches operate. By monitoring the shifting of the clutches with this circuit, the clutches can be adjusted until shifting of the clutches causes the first indicator to be actuated, and when this result is obtained, a proper shift occurs.

3,582,930

DEVICE FOR INDICATING THE PRESENCE OF CONDUCTIVE FLUIDS

Alfred N. Wiley, 431 Glenchester, Houston, Tex.

Filed Mar. 11, 1969, Ser. No. 806,152
Int. Cl. G08b *21/00*
U.S. Cl. 340—244 **1 Claim**

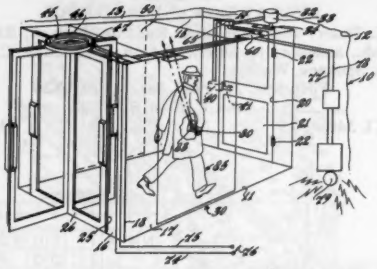


An electrical device for sensing the presence of fluids includes a pair of spaced electrodes connected in a series electrical circuit with an indicator and a source of electrical energy. Contact of the electrodes with an electrically conductive fluid completes the electrical circuit through the space between the electrodes and the resulting current flow activates the indicator.

3,582,931
PILFERAGE-PREVENTION SYSTEM

Daniel Nawrocki, R.D. #2 Berlin Ave., Mays Landing, N.J.

Filed Oct. 18, 1967, Ser. No. 676,269
Int. Cl. G08b 13/14
U.S. Cl. 340—258 1 Claim

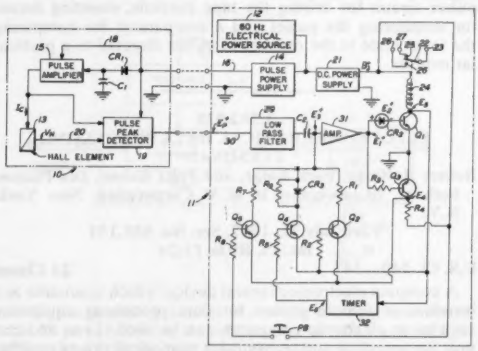


This invention is concerned essentially with apparatus for location in a building to detect and prevent pilferage therefrom, wherein is provided a controlled exit passageway, alarm means, and radiation-receiving means communicating with the passageway and connected to actuate an alarm means, so that radiation-producing means carried by an article being pilfered is detected in the passageway and its detection signaled.

3,582,932
MAGNETIC-FIELD-RESPONSIVE PROXIMITY DETECTOR APPARATUS

Richard M. Chapman, Columbus, Ohio, assignor to F. W. Bell Inc., Columbus, Ohio

Filed Oct. 11, 1968, Ser. No. 766,771
Int. Cl. G08b 13/24
U.S. Cl. 340—258 12 Claims

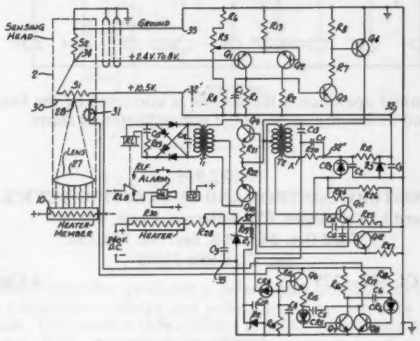


The ferromagnetic material comprising a motor vehicle will result in distortion of an environmental magnetic field primarily comprised of a portion of the earth's magnetic field and a detector apparatus is provided for sensing this field. The detector apparatus includes a magnetic field-sensing probe positioned in electromagnetically coupled relationship to this environmental magnetic field and provides a probe output voltage signal proportionally related to the magnetic field sensed and indicative of vehicle-produced distortions. An output circuit connected to receive this signal is controlled in its operation by a control circuit which is capable of maintaining detecting capability as to vehicle-caused distortions of the magnetic field irrespective of changes in the quiescent magnetic field intensity of the environmental magnetic field. This capability is effected by a regulating amplifier through a feedback connection from the output circuit.

3,582,933
PROXIMITY DETECTOR

Willard Porter Place, 1210 Eighth Ave., Irwin, Pa.

Filed Oct. 3, 1968, Ser. No. 764,861
Int. Cl. B60g 1/50
U.S. Cl. 340—258 9 Claims



The fail-safe radiation detector of this invention senses the proximity between bodies movable relative to each other whether on the same way, track or crossing, that would lead to collision if not stopped in time. The sensing detector of each mobile body is angularly adjustable having a prescribed field of view effective within a preselected safe distance measured by the distance represented by the natural tangent function of the preselected angle of adjustment as the distance for alarm and arrest of the mobile body through a sensor normally exposed to a pulsating source of radiation. This can be a semiconductor, a tungsten filament lamp or a glowlamp. It may be referred to as the lamp or light or a radiant energy, whether it be microwave, heat or visible light will be called light. The radiant energy partly reduces the resistance of the sensor placing a more positive voltage on a transistor circuit and maintains the radiant energy pulsating and retains an open alarm circuit until the sensor is subjected to a radiant source of energy from the adjacent body which materially reduces the sensor resistance and floods the transistor circuit with greater operating energy shutting off the pulsating radiant energy and releasing the alarm relay causing it to sound an alarm and stop the mobile body before collision. Different novel circuit arrangements are employed to maintain the alarm relay energized as it only operates the alarm when the power fails or it is dropped out due to the sensor receiving the necessary radiant energy to materially change its resistance. This novel circuit also provides different modes of pulsating the pilot lamp or other source of radiant energy, which is important to this invention.

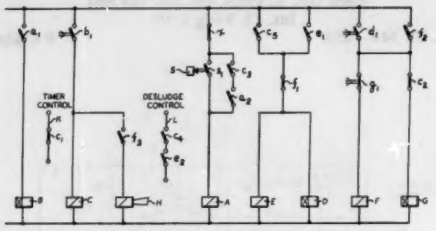
3,582,934
CONTROL DEVICE FOR CENTRIFUGAL SEPARATORS OR CLARIFIERS

Bernhard Zumhulsen, Westphalia, Germany, assignor to Westfalia Separator A.G., Westphalia, Germany

Filed Mar. 20, 1968, Ser. No. 714,511
Claims priority, application Germany, Mar. 23, 1967, W43624
Int. Cl. G08b 21/00; B04b 15/00
U.S. Cl. 340—267 3 Claims

Control device for centrifugal separators or clarifiers, which when excited by a trouble signal interrupts normal

operating controls and initiates one or two desludging cycles to correct the malfunction. The device returns the separator



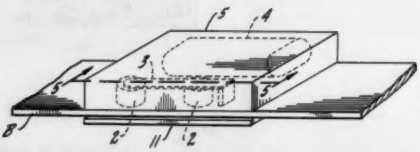
to normal operation if the trouble is corrected by the first or second desludging cycle and, if not, activates an alarm.

3,582,935

POSTURE CONTROL AND CORRECTING DEVICE

Richard L. Verhaeghe, 676 Jefferson, Crete, Ill.

Filed Oct. 24, 1968, Ser. No. 770,336
Int. Cl. G08b *21/00*
U.S. Cl. 340—279 **4 Claims**



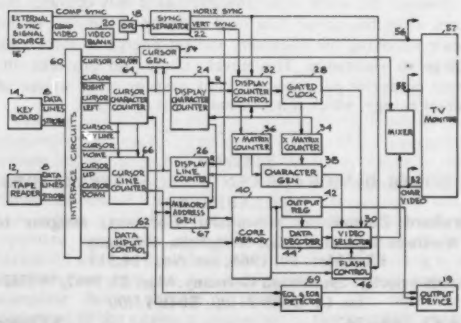
A body encircling belt having a housed motor (electromagnetic, spring or other) of minimal size fixedly mounted thereon having a body contacting triggering device connected to and controlling its operation, said device being operable with the imparting of thrust or other appropriate movement thereto from its body contacted portion to activate the motor, and with discontinuance of thrust or appropriate movement thereto, to deactivate it, and a signal means connected to and operable by the activated motor.

3,582,936

SYSTEM FOR STORING DATA AND THEREAFTER CONTINUOUSLY CONVERTING STORED DATA TO VIDEO SIGNALS FOR DISPLAY

Martin N. Kite, Morton Grove; Robert E. Gettings, North Brooke, and Roman A. Adams, Skokie, all of, Ill., assignors to The A. B. Dick Company, Chicago, Ill.

Filed Jan. 2, 1968, Ser. No. 704,967
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 **13 Claims**



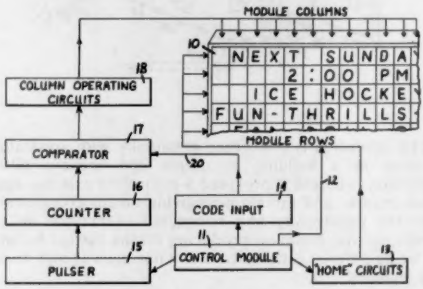
A system for continuously reading data out of memory, decoding said data, and using it to select representative video signals generated by a character generator, which are then displayed on a television monitor. Incoming data is stored in memory at an address corresponding to the location of a cursor displayed on the monitor. The system operates at frequencies used for home television receivers.

3,582,937

DISPLAY SIGN AND CONTROLS

Bill E. Dozer, and Charles A. Ratcliffe, both of, Richland, Wash., assignors to American Sign & Indicator Corporation, Spokane, Wash.

Filed Apr. 21, 1969, Ser. No. 817,826
Int. Cl. H04n *1/00*
U.S. Cl. 340—325 **13 Claims**



A display sign comprising a plurality of modules each having a movable tape with desired indicia imprinted thereon. Motor-operated control means is provided within each module to selectively return the tape to a reference condition or "home." Operating controls are provided to selectively move the tape from this reference condition to a final condition wherein the desired indicia is displayed on the module. The controls include a code input having a signal representative of the number of steps required for such movement, a pulser circuit for driving the tape controls, counting means for monitoring the pulses and a comparator for comparing the input code to the number of pulses directed to a particular module.

3,582,938

ELECTROMECHANICAL DATA PROCESSING TERMINAL

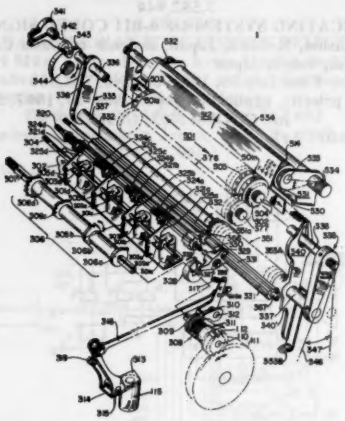
Robert Hoffman, Park Ridge, and Fritz Keiser, Des Plaines, both of, Ill., assignors to SCM Corporation, New York, N.Y.

Filed July 21, 1967, Ser. No. 655,131
Int. Cl. H03k *13/24*
U.S. Cl. 340—347 **24 Claims**

A compact electromechanical device, which is suitable as a terminal or remote station for data processing equipment such as an electronic computer, can be used (1) as an input unit for encoding and transmitting numerical values or other forms of information into the data process equipment for use in computations or other types of known data processing operation, and (2) as an output unit for decoding the output from the data process equipment and printing the thus decoded information in the form of decimal data or other forms of information.

The device comprises three sections: an input or keyboard-encoding section, a decoding section, and a printout section. The input section comprises a plurality of keys arranged in two rectangular arrays, one array of keys serving as decimal data entry keys and the other serving as function entry keys. The keys are connected to an encoder which upon depression of the keys sequentially encodes the data inputs into combinations of binary coded electrical signals and encodes the function inputs to different combinations of binary coded electrical signals which instruct the data processing equipment or the decoding section of the device to perform predetermined functions. The decoding section sequentially

decodes the binary coded electrical signals to decimal output and stores serially, in the same sequential order, the thus decoded information in a register. Thereafter, a transfer



mechanism is actuated to transfer simultaneously the contents of the register to an ordinal series of printing elements. The printout section is then actuated to print out the information stored in the print elements on a record material.

3,582,939

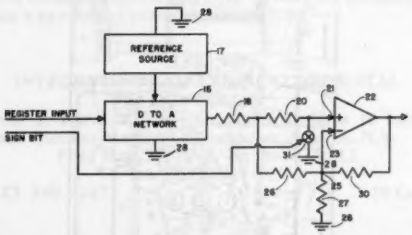
BIPOLAR DIGITAL-TO-ANALOG CONVERTER

Douglas B. Campbell, Natick, Mass., assignor to Honeywell Inc.

Continuation of application Ser. No. 531,089, Mar. 2, 1966, now abandoned. This application Sept. 19, 1969, Ser. No. 859,534

Int. Cl. H03k *13/02*

U.S. Cl. 340—347DA **3 Claims**



A digital-to-analog converter, having a single conversion network powered from a single source of reference voltage, applies the analog voltage from the conversion network to a resistor network feeding a differential amplifier. The sign portion of the input digital signal operates a switch connected with one amplifier input terminal to invert the amplifier output polarity for one polarity of input signals and thereby provide for conversion of both positive and negative input digital signals.

3,582,940

ANALOGUE-TO-DIGITAL CONVERTER

Gunnar Axel Kihlberg, Sollentuna, Sweden, assignor to Jungner Instrument Aktiebolag, Stockholm, Sweden

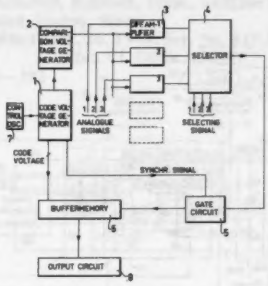
Filed Nov. 13, 1967, Ser. No. 682,051

Claims priority, application Sweden, Nov. 18, 1966, 15830/66

Int. Cl. H03k *13/20*

U.S. Cl. 340—347AD **2 Claims**

An analog-to-digital converter is disclosed which is capable of handling, in time-multiplexed fashion, a number of analog input signals. A code generator generates a frame of pulses which include all possible digital outputs. Each analog signal is compared with comparison reference voltage which is synchronized in time with the code generator output. A differential amplifier produces a pulse which commences when the comparison voltage and analog signal are equal in magnitude. This pulse is then utilized to select the correct digital output, from the frame of pulses generated by the code generator, which corresponds to the magnitude of the analog signal.



3,582,941

NONLINEAR DECODER

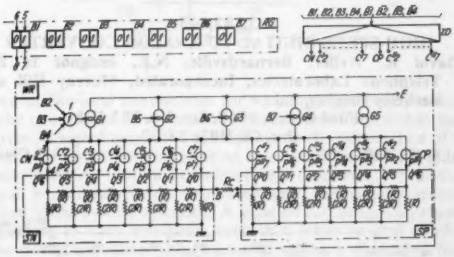
Alain Yves Le Maout, Creteil, and Claude P. Lerouge, Montgeron, both of, France, assignors to International Standard Electric Corporation

Filed Nov. 28, 1967, Ser. No. 686,072

Claims priority, application France, Nov. 28, 1966, 85235

Int. Cl. H03k *13/04*

U.S. Cl. 340—347 **5 Claims**

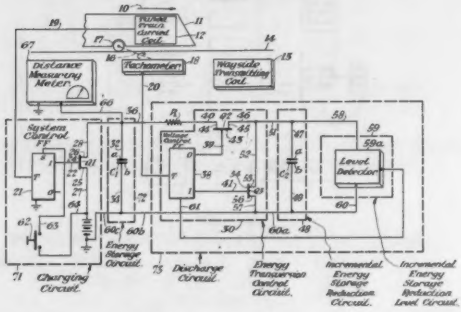


There is provided a decoder for PCM (pulse code modulated) signals previously coded in binary form from an analog signal. The most significant of seven digits is used to determine the polarity of the original signal and to determine the selection of one or the other of two sets of seven gates. The following three digits control a current generator establishing a source of current having an amplitude eight times (8I) that of the basic quantizing step (current level I). The same three digits also establish control of one of seven gates to inject the current from the current generator into a resistor ladder network. The three least significant digits are used in the control of three other current generators (at levels 4I, 2I and I) which supply additional current at the injection point to enable reproduction of the analog signal. An analog signal representing the code group may then be taken between output terminals of the two resistor ladders.

3,582,942
DIGITAL-TO-ANALOG CONVERSION CIRCUIT

William L. Carter, Jr., Pittsburgh; Raymond G. Stein, Jr., Allison Park, and Donald R. Little, Greenburg, all of, Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Oct. 28, 1968, Ser. No. 771,030
Int. Cl. H03k 13/20
U.S. Cl. 340—347AD 11 Claims

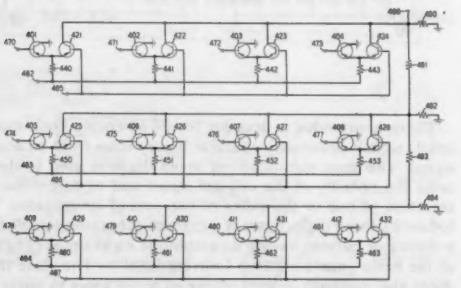


This invention relates to a digital-to-analog conversion circuit to operate from an initial reference point over a given range to a final reference point. The circuit includes an energy storage device, a charging circuit, and a discharging circuit. The charging circuit is electrically coupled to the energy storage device for initially controlling the amount of energy stored therein. The discharging circuit has a digital pulse input which has pulse rates within a given frequency range. The discharging circuit is electrically coupled to the energy storage device to incrementally reduce the amount of energy stored in the energy storage device. This is done as a function of both the digital pulse rate and a preselected incremental energy reduction rate. The energy storage device has an output taken across the energy storage device and this output has an analog value which is proportional to the difference between the above-noted final reference point and an intermediate point of the aforementioned given range.

3,582,943
HIGH-SPEED DIGITAL-TO-ANALOG CONVERTER

David R. Weller, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Dec. 9, 1968, Ser. No. 782,103
Int. Cl. H03r 13/02
U.S. Cl. 340—347 7 Claims

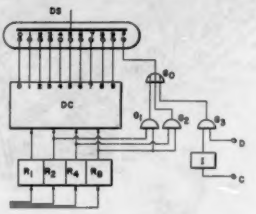


A high-speed digital-to-analog converter of the current-summing type is disclosed wherein a digital control register drives a plurality of current sources, all of the current sources being simultaneously switched on or off when digital inputs are applied. The time at which the simultaneous switching occurs is determined by the bias level of the current switches which is, in turn, determined by the characteristics of the digital control register.

3,582,944
INDICATING SYSTEM OF 4-BIT CODED SIGNAL

Toshio Kashio, Kodaira, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed July 30, 1968, Ser. No. 748,800
Claims priority, application Japan, Aug. 11, 1967, 51,188
Int. Cl. G06f 5/02; G09f 9/00
U.S. Cl. 340—347 4 Claims

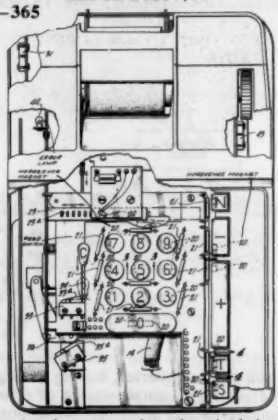


An indicating system of 4-bit coded signal suitable to indicate each of the 16 possible combinations of the 4-bit coded signal by using a normal decimal numeral indicating device having a capacity for the numerical values 0—9 and combining a point indication therewith.

3,582,945
INPUT DEVICE

William J. Bowers, Claremont, Calif., assignor to MSI Data Corporation, Montclair, Calif.

Filed Apr. 29, 1968, Ser. No. 724,978
Int. Cl. G08c 9/04
U.S. Cl. 340—365 12 Claims



An input device for generating electrical data signals and an associated electrical timing signal and which input device is a modified conventional calculating machine. The machine may be an adding machine having a plurality of manually operated data keys for mechanically entering data into the machine in a conventional fashion and a machine element movably responsive to the release of an actuated key. Each data key is associated with a magnetically operable reed switch that is arranged to be operated by a permanent magnet mounted to be movable with the operation of a data key to provide the electrical data signal. The machine element may be an indexable machine carriage carrying an apertured index indicator for photoelectrically generating the timing signal associated with the electrical data signal. The photoelectric system has a light source mounted on one side of the carriage index indicator and a normally dark light sensor mounted on the opposite side of the index indicator. The release of an operated key will index the machine carriage

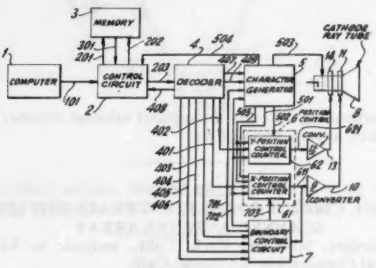
one position and cause the illumination of the light sensor during the indexing operation to thereby generate the electrical timing signal.

3,582,946

CATHODE/RAY TUBE DISPLAY DEVICE

Yoshinari Mita; Yoziro Kusaka; Keizo Morita, and Yorimasa Watanabe, all of, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo-to, Japan

Filed Sept. 23, 1968, Ser. No. 761,662
Claims priority, application Japan, Sept. 28, 1967, 42/62568
Int. Cl. G06f *3/14*
U.S. Cl. 340—324A 1 Claim



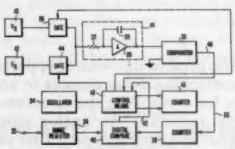
A cathode-ray tube (CRT) display device for alphanumeric characters includes a first boundary register for storing the numerical value of a boundary defining the beginning of a row line of characters to be displayed on the CRT. A second boundary register stores a numerical value representing the end of the row line. A first position control counter designates the position of a character in the row line direction. A boundary detector compares the numerical value of the second boundary register with the numerical value of the first position control counter. When the result of the comparison shows that the first position control counter value is larger than the second boundary register, a check pulse is initiated which is employed to reset the counters and initiate a new line of characters on the CRT.

3,582,947

INTEGRATING RAMP ANALOG TO DIGITAL CONVERTER

Thomas J. Harrison, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1968, Ser. No. 715,812
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 10 Claims



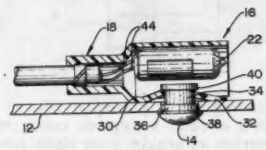
A multiple integrating ramp analog to digital converter is provided wherein an unknown analog input signal is coupled to an integrator for a variable time. The variable time is determined by an integral number of cycles of operation of a counter which is stepped at a predetermined rate while the unknown voltage is being integrated. During this time the output voltage of the integrator goes from an initial level to a second level. When the required time has elapsed, a reference voltage of opposite polarity to the unknown input voltage is coupled to the integrator and the counter is stepped at the predetermined rate. During this time the output voltage of the integrator starts from the second level and, when the initial voltage level appears at the output of the integrator, the counter is stopped and that count then provides a digital representation of tee unknown analog input signal.

3,582,948

FLUSH MOUNT INDICATOR HOUSING WITH FLEXIBLE TONGUE

Edward B. Mitchell, Belmont, Mass., assignor to United-Carr Incorporated, Boston, Mass.

Filed Mar. 26, 1969, Ser. No. 810,578
Int. Cl. G08b *5/36*
U.S. Cl. 340—381 1 Claim



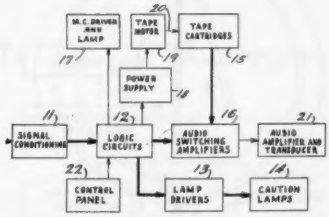
This invention is directed at an indicator housing having a flexible forklike member with a keyhole slot formed therein adapted to encase a lens member placing the forklike member under flexure.

3,582,949

AUDIOVISUAL ANNUNCIATOR WITH PRIORITY RANKING FOR EACH CONDITION

Svenaage Forst, Costa Mesa, Calif., assignor to Master Specialties Company, Costa Mesa, Calif.

Filed Oct. 28, 1968, Ser. No. 770,941
Int. Cl. G08b *19/00, 29/00*; H04q *3/00*
U.S. Cl. 340—410 10 Claims



An audiovisual annunciator for warning a system operator of the occurrence of various monitored conditions within the system. A signal generated in response to the occurrence of a monitored condition energizes an associated warning lamp to visibly indicate that the condition has occurred. An audio signal is simultaneously generated and acoustically transmitted to the system operator. A logic circuit assigns a priority ranking to each condition, such that, when several conditions occur simultaneously, an audio signal is generated for only the highest priority condition. If the operator acknowledges the highest priority annunciated condition, an audio signal is transmitted for the next highest priority occurring condition. The operator may recall a silenced warning so long as the condition continues to exist. A switch permits the operator to test the warning lamps, the priority circuitry, and the audio circuitry.

3,582,950

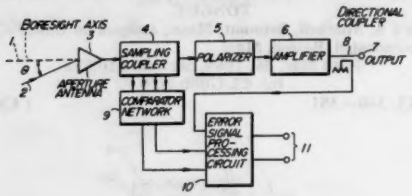
TRACKING ANTENNA SYSTEM

Mitsuo Tanaka, and Masao Kamimura, both of Kokubunjishi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1969, Ser. No. 824,620
Claims priority, application Japan, May 17, 1968, Aug. 7, 1968
43/32891 and 43/55515
Int. Cl. G01s *3/04*
U.S. Cl. 343—113 8 Claims

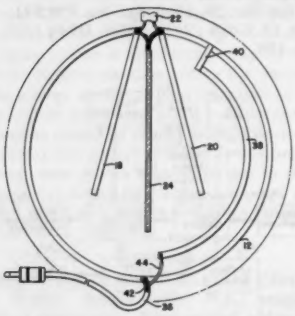
A tracking antenna system capable of detecting a difference between the direction of an incoming wave and that

of the boresight axis of an aperture antenna of the system and capable of detecting the direction of polarization of the incoming signal. The system comprises a sampling coupler



for selectively leading out a particular one of the higher modes excited in a circular waveguide connected with the antenna and comprises an angular error signal processing circuit in association with the sampling coupler.

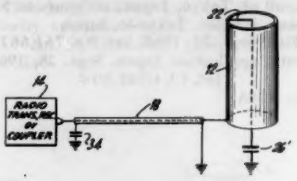
3,582,951
HELMET ANTENNA
John Altmayer, Euclid, Ohio, assignor to New-Tronics Corporation, Cleveland, Ohio
Filed June 10, 1968, Ser. No. 735,915
Int. Cl. H01q *1/44, 7/00, 9/14*
U.S. Cl. 343—718 **4 Claims**



An antenna having a configuration which may be positioned entirely within a conventional helmet formed of a dielectric material. The antenna is comprised of a loop-type, conductive member having a capacitance connected between the ends thereof, and a pair of elongated conductive elements extending from the ends of the loop-type member and diverging outwardly with respect to each other. The capacitance includes a fixed capacitor connected in parallel with a short length of coaxial cable which may be trimmed off to alter the total capacitance between the ends of the loop-type conductive member to thereby resonate the antenna.

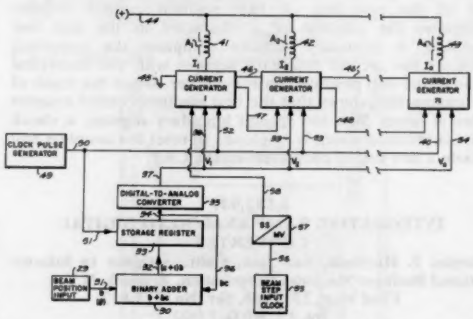
3,582,952
SHORT HIGH-FREQUENCY ANTENNA AND FEED SYSTEM THEREFOR
John L. Heins, Massapequa Park, Long Island, N.Y., assignor to Aero Systems, Inc., Miami, Fla.
Filed Dec. 11, 1968, Ser. No. 789,644
Int. Cl. H01g *9/30*
U.S. Cl. 343—750 **13 Claims**

An antenna system is described wherein a short antenna of about 0.1 λ or less is employed with a coaxial cable feed. The coaxial cable is directly connected to ground at but one end thereof and is coupled to ground at the other end via a capacitor. The capacitor is selected to provide good matching of a transceiver to the antenna with or without a coupler. In an alternate antenna system a loading network is employed which is mounted within the antenna to provide a



stably performing antenna throughout adverse weather conditions such as rain, snow or ice.

3,582,953
CONTROL CIRCUIT FOR SETTING PHASE SHIFTERS IN SCANNED ANTENNA ARRAY
Glen Martner, Monterey Park, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.
Filed June 9, 1969, Ser. No. 831,501
Int. Cl. H01q *3/26*
U.S. Cl. 343—854 **7 Claims**

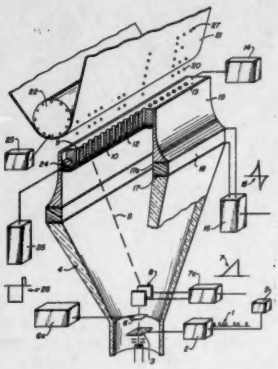


According to the present disclosure, apparatus and process is provided for controlling delay devices in antenna elements of antenna arrays for controlling the direction of propagation of electromagnetic radiation. An analog signal is developed from a digital signal and operates on a first control device in a predetermined manner. The analog signal is subsequently altered, as by altering the digital signal in a binary adder, and the altered analog signal operates on the next control device. The control devices are arranged in sequential relation and are successively operated by a clock.

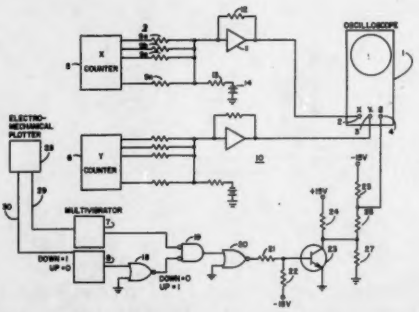
3,582,954
PRINTING BY SELECTIVE INK EJECTION FROM CAPILLARIES
Stephen F. Skala, 3839 South Wenonah, Berwyn, Ill.
Filed Feb. 24, 1969, Ser. No. 801,647
Int. Cl. G01d *15/16*; **G01k** *1/12*
U.S. Cl. 346—1 **16 Claims**

A capillary ink printing method and apparatus in which

capillaries are selectively filled with ink, the ink is moved to the capillary surface, and the ink is ejected to move from the capillary surface to a printing-receiving surface.



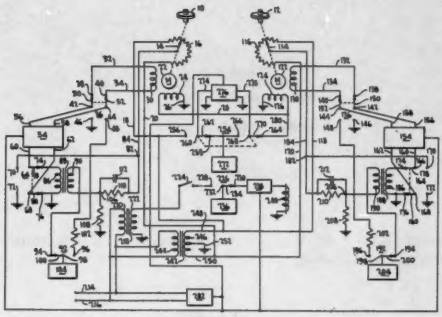
3,582,955
OSCILLOSCOPE DISPLAY FOR PLOTTING DEVICE
James A. McMurray, Metedeconk, and John T. Walsh, Highlands, both of, N.J.
Filed Sept. 24, 1969, Ser. No. 868,958
Int. Cl. G01d *7/10*
U.S. Cl. 346—17 **1 Claim**



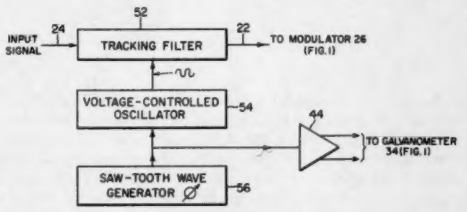
The specification describes an oscilloscope display for binary signals being plotted on a mechanical plotting device. A control circuit for the oscilloscope is disclosed which blanks the oscilloscope beam if either the pen of the mechanical plotting device is up or if the device is not plotting.

3,582,956
APPARATUS FOR RECORDING AND REPRODUCING HANDWRITING
Harvey L. Huston, 3900 Palmira Lane, Silver Spring, Md., and Donald K. Belcher, Lexington, Ky. assignor to said Huston, by said Belcher
Filed July 8, 1968, Ser. No. 743,109
Int. Cl. G11b *31/00*; **B43k** *29/08*
U.S. Cl. 346—33 **2 Claims**

Apparatus for recording and reproducing handwriting comprising a tape recorder for recording handwriting signals from the tap of a potentiometer corresponding to movement of a pen in a first direction, from the tap of another potentiometer corresponding to movement of the pen in a second direction perpendicular to the first direction, from a reference supply which supplies signals to the potentiometers, and from a switch corresponding to movement of the pen in a third direction perpendicular to the first and second directions, and pen operating apparatus for reproducing the handwriting in accordance with the signals recorded in the tap recorder.



3,582,957
FREQUENCY ANALYZER
Arne J. Herleikson, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy
Filed Feb. 26, 1969, Ser. No. 802,528
Int. Cl. G01r *23/18*
U.S. Cl. 346—33 **1 Claim**



A system for analyzing and displaying in real time the frequency components of a complex analog signal. In a preferred embodiment, a tracking filter is periodically swept over a frequency band of interest by a sine wave received from an oscillator the operation of which is in turn controlled by a sawtooth wave generator. The output of the tracking filter is employed to intensity modulate a light beam. The modulated beam is directed to the mirror of a galvanometer, and, when this mirror is oscillated by the output of the sawtooth wave generator, the beam reflected therefrom is swept in cyclic fashion laterally across a moving film or sensitized paper to develop thereon a record of the frequency characteristics of the input energy.

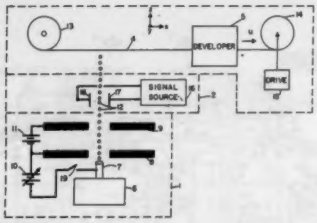
ERRATUM

For Class 346—74 see:
Patent No. 3,582,877

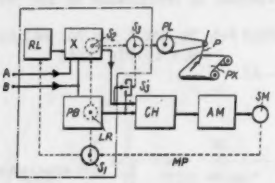
3,582,958
ION BEAM PRINTER
Charles D. Hendricks, Jr., Chestnut Hill, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Apr. 26, 1968, Ser. No. 724,548
Int. Cl. G01d *15/06*, *15/18*
U.S. Cl. 346—74 **15 Claims**

Apparatus adapted to provide an ion beam of large or

small, single or multiatomic ions, the beam being directed upon a web to impress a message upon the web. Means is provided to modulate the beam thereby to determine the form of the message.



3,582,959
WIDE RANGE LOGARITHMIC RECORDING APPARATUS
Takao Matsumoto, 60, Kuritaya, Kanagaina-ku, Yokohama-shi, Japan
Filed Feb. 6, 1968, Ser. No. 703,297
Claims priority, application Japan, Feb. 6, 1967, 42/7609
Int. Cl. G01r *13/04*
U.S. Cl. 346—65 **8 Claims**



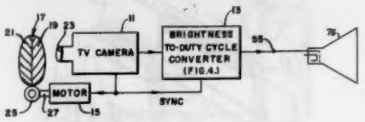
A wide range logarithmic recording apparatus comprising a range switching circuit including resistors connected to respective digits and arranged to receive electric signals to be recorded, and a potentiometer type balancing circuit including a logarithmic variable resistor. Input signals are fed jointly to the range switching circuit and to the balancing circuit. An automatic control circuit is provided and includes a rotary switching device coupled to the logarithmic variable resistor, and a group of relays are actuated by the switching device and a range switching circuit is controlled by the relay. A chopper is connected to receive the difference between the output from the range switching circuit and the output from the balancing circuit and a servomotor is responsive to the chopper output to drive the rotary switching device, the logarithmic variable resistor and the range switching device, and a writing means is driven by the range switching device to record the signal.

ERRATA

For Classes 178—6.5 thru 260—93.5 see:
Patent Nos. 3,582,960 thru 3,582,987

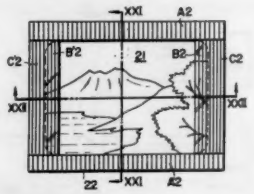
3,582,960
COLOR TELEVISION SYSTEMS USING A SINGLE GUN COLOR CATHODE RAY TUBE
Edwin H. Hilborn, Framingham, and Ernest E. Gaiser, Waltham, both of, Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Nov. 26, 1968, Ser. No. 779,169
Int. Cl. H04n *9/06*
U.S. Cl. 178—5.2R **10 Claims**

This disclosure describes systems for controlling the three attributes of color (brightness, hue and saturation) in a single-gun, current-sensitive color cathode-ray tube (CRT). Means are provided for modifying standard broadcast signals to permit the reception and display of imagery with this tube, or alternatively, for modifying a monochromatic closed circuit television system to display colored imagery.



The invention described herein was made by employees of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

3,582,961
SYSTEM FOR DISPLAYING A TWO-DIMENSIONAL PHOTOGRAPHIC PICTURE IN THREE DIMENSIONS
Chushiro Shindo, No. 14—12 1-Chome, Kinski Sumida-ku, Tokyo, Japan
Filed Mar. 29, 1968, Ser. No. 717,107
Claims priority, application Japan, May 1, 1967, 42/27562
Int. Cl. H04n *5/72*; **G02b** *5/00*
U.S. Cl. 178—6.5 **20 Claims**

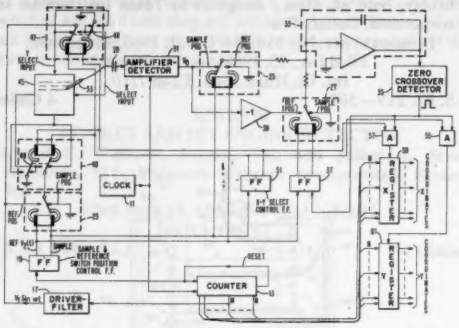


Displaying a two-dimensional photographic picture or portrait as if it is a three-dimensional one consisting of a front pattern, a back pattern and a photographic picture such as a photograph, a picture, printed matter or a photographic portrait by projecting the same on a screen such as a cinema screen television, or the like, wherein the front pattern and said back pattern are optically spaced from each other on a photographic picture or said screen to form a projected optical illusion image of said end area.

3,582,962
HAND ENTRY POSITION SENSING SYSTEM
Robert V. Mazza, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 31, 1968, Ser. No. 772,295
Int. Cl. G08c *21/00*
U.S. Cl. 178—19 **15 Claims**

A position measuring system of the writing tablet-stylus type employs a sampling control circuit which acts to sample tablet voltage in a manner to provide an output linearly representative of stylus position independent of the coupling admittance between the stylus and voltage carrying surface of the tablet. A first tablet voltage, which is a composite function of both the stylus position and the coupling admittance between the stylus and the voltage carrying surface of the tablet, is sampled and integrated over a set time interval. A second reference voltage, which is a function of only

the coupling admittance, is integrated in time until it reaches the level of integration reached by the first integrated voltage. The time of integration of the second voltage is linearly related to stylus position independent of coupling admittance.

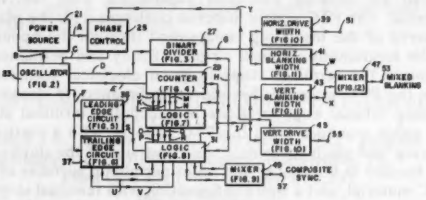


3,582,963

FREQUENCY CONTROLLABLE SYNCHRONIZING GENERATOR FOR TELEVISION SYSTEMS

Allan G. Bennett, Marietta, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 14, 1968, Ser. No. 752,555
Int. Cl. H04n *5/06*
U.S. Cl. 178—69.5 **10 Claims**



The disclosure describes a frequency controllable synchronizing generator for television systems. A variable frequency oscillator applies signals to a binary divider, a presettable counter, a leading edge circuit, and a trailing circuit. One output of the binary divider drives a horizontal drive width circuit and a horizontal blanking width circuit. The output from one of the latter stages of the counter drives a vertical blanking width circuit and a vertical drive width circuit. The horizontal blanking width circuit output and the vertical blanking width circuit output are mixed to provide a mixed blanking signal. The outputs of several of the early stages of the counter and the output from the latter stage of the counter are combined with the outputs from the leading edge circuit and the trailing edge circuit, and a second output of the binary divider in logic circuits to control the generation of a plurality of outputs. The plurality of outputs from the logic circuits are mixed to provide a composite sync signal. By adjusting the oscillator and the presettable counter, frequency controllable television control signals are generated.

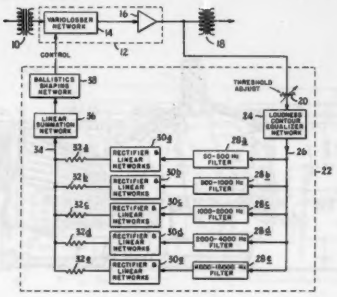
3,582,964

AUTOMATIC LOUDNESS CONTROLLER

Emil L. Torick, Darien, Conn.; Richard G. Allen, Pound Ridge, N.Y.; Benjamin B. Bauer, and Allan J. Rosenheck, Stamford, Conn., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Sept. 30, 1968, Ser. No. 763,897
Int. Cl. H03g *3/24*
U.S. Cl. 179—1 **8 Claims**

In the particular embodiment of the invention described herein, program signals are supplied to a unity gain amplifier. An analysis of program loudness is made by equalizing the signals in accordance with a selected ear sensitivity response characteristic. A plurality of band-pass filters divide the equalized signals and the divided signals are first rectified and then combined linearly by a combining network. The



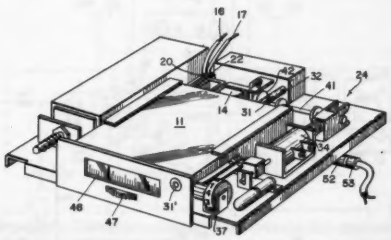
combined signal is then supplied to a ballistics shaping network which simulates the ballistic characteristic of the human ear. The resulting control signal is then supplied to a variable gain stage of the unity gain amplifier to vary the gain of the amplifier to control thereby the loudness level of the program material.

3,582,965

TAPE CARTRIDGE PLAYER WITH TUNER CARTRIDGE

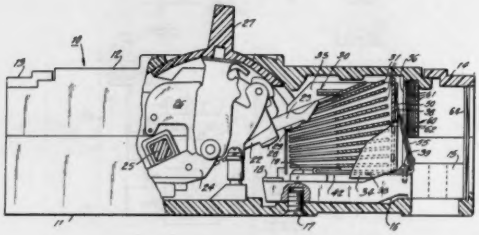
John S. DeMetrick, Lexington, Mass., assignor to Automatic Radio Manufacturing Co., Inc., Melrose, Mass.

Filed Dec. 7, 1966, Ser. No. 599,887
Int. Cl. G11b *1/04, 31/00;* **H04b** *1/06*
U.S. Cl. 179—100.11 **12 Claims**



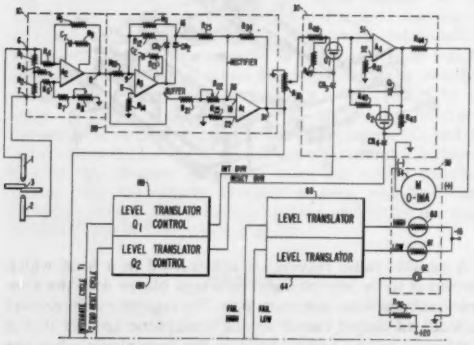
A tunable radio receiver is constructed in a form which permits it to be interchanged in a tape player with the conventional magnetic tape cartridge. The tunable radio receiver includes an output circuit having a magnetic coupler that is juxtaposed to the pickup head in the tape player when the radio receiver is inserted into the tape player. The coupler inductively couples signals to the pickup head to cause radio transmissions received by the radio receiver to be audibly reproduced through the tape player. The tunable radio receiver is arranged to obtain all its operating power through a pair of contacts in the tape player which are normally used to actuate a mechanism to reposition the pickup head after it has completely scanned a track on a multitrack magnetic tape. The tunable radio receiver has provisions for permitting it to connect to an external antenna. Further, the tunable radio receiver is arranged to actuate a switch to disable the tape drive motor in the tape player when the radio receiver is inserted into the player.

3,582,966
VENTING MEANS FOR CIRCUIT BREAKER ARC QUENCHER
Albert Strobel, Cherry Hill, N.J., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.
Filed Dec. 30, 1969, Ser. No. 889,208
Int. Cl. H01h 9/30
U.S. Cl. 200—144 10 Claims



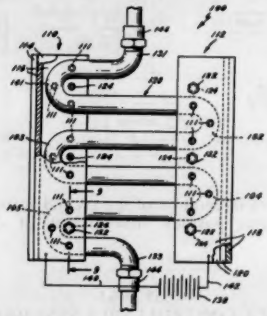
A flexible arc shield or baffle at the rear of the arc chute in a circuit breaker is provided with a support for controlling baffle deflection during arc interruption. The circuit breaker cover in the region adjacent to the arc chute is provided with riblike formations that limit the deflection of the baffle so that it does not block the cover openings covered by deionizing screens. This function is aided by a support plate which limits deflection of the baffle in the direction of arcing gas flow as the gas leaves the arc chute at the rear thereof.

3,582,967
WELD QUALITY INDICATOR
George Beckman, Utica, and Tracy B. Gunderman, Clinton, both of, N.Y., assignors to Digimetrics, Inc.
Filed Feb. 10, 1969, Ser. No. 797,802
Int. Cl. B23k 9/10, 11/24
U.S. Cl. 219—109 10 Claims



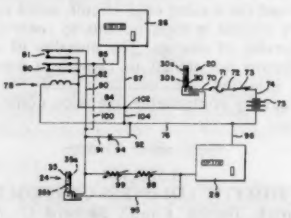
Apparatus is disclosed for developing a signal proportional to the total energy supplied to a weldment by the electrodes of an electrical welding machine during the welding cycle. The input signal to the apparatus is the AC voltage signal across the electrodes of the welding machine. The signal is rectified, and time integrated over the duration of the weld cycle. The integrated signal, which is proportional to the total energy delivered to the weldment, is compared to preset high and low reference levels. The result of the comparison indicates whether sufficient energy was supplied to the weldment to make a lasting weld.

3,582,968
HEATERS AND METHODS OF MAKING SAME
Francis P. Buiting, Plainville, and Henry David Epstein, Cambridge, both of, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 510,854, Dec. 1, 1965, abandoned.
Filed Dec. 23, 1968, Ser. No. 786,000
Int. Cl. H05b 3/40; F24h 1/10
U.S. Cl. 219—300 4 Claims



Electrical heating devices and methods for making same comprising plastic material having a positive temperature resistivity coefficient (PTC) provided with an insulating plastic encapsulent in which foraminous terminal strips are employed for making electrical connection with the PTC material. The PTC plastic material coalesces with the plastic material of the insulating encapsulent through the openings in the foraminous terminal strips to firmly and permanently maintain the terminal strips in good electrical connection with the PTC material. Several embodiments are shown including tubular configurations in which the terminal strips are either wound around the PTC material with a particular spacing and pitch to control the resistivity of the device, or are located at both inner and outer peripheral surfaces of the PTC material, and a web configuration with terminal strips in clamping engagement with opposite ends of the web or on opposite faces thereof. Also disclosed is a heating device comprising a tubular element formed with a series of bends between terminal elements.

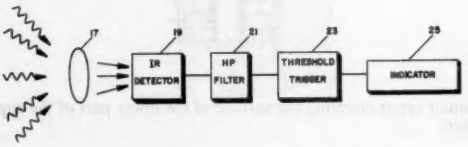
3,582,969
RECORDING DEVICE FOR ROTATABLE MIXERS
Audry R. Kinney, 231 Belmont Terrace, Mount Vernon, Wash.
Filed Aug. 19, 1968, Ser. No. 753,674
Int. Cl. G06f 7/38
U.S. Cl. 235—92 11 Claims



A counter system including a magnetically actuatable switch housed in a protective case. The case is secured to a frame supporting a rotatable mixing drum. A magnetic actuator is resiliently mounted on the drum and is moved past and close to the switch at each drum revolution. The switch is connected through an electrical circuit to a counter so that

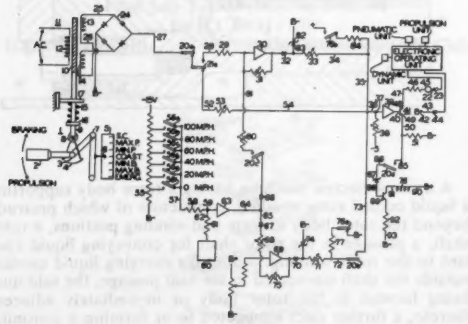
total revolutions of the drum are measured. A second counter system measures both total and mixing speed revolutions of the drum. In this second system one counter is actuable only if the drum is turning at a preselected speed. Two switches are used and they are connected to an electrical circuit which provides a signal to the mixing counter only if the drum is turning at mixing speed.

3,582,970
ROCKET AND JET ENGINE DETECTOR
Richard E. Williams, Reston, Va., and Julian A. Scott, Rockville, Md., assignors to Scope Incorporated, Reston, Va.
Filed June 19, 1968, Ser. No. 738,245
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 **4 Claims**



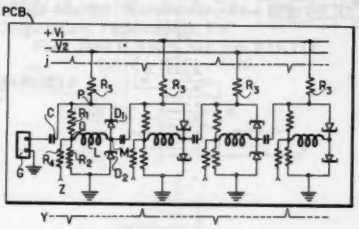
A rocket and jet engine detector for investigating the amplitude modulation of the infrared energy produced by the engines including an infrared detector, a high-pass filter for rejecting amplitude modulation at frequencies below about 500 Hz. and a threshold trigger coupled to the filter for providing an output signal.

3,582,971
PROPULSION AND BRAKING CONTROL SYSTEM FOR RAILWAY VEHICLES
Rudolph A. Coccia, North Versailles, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Oct. 29, 1969, Ser. No. 872,331
Int. Cl. H02g *3/00*
U.S. Cl. 307—9 **11 Claims**



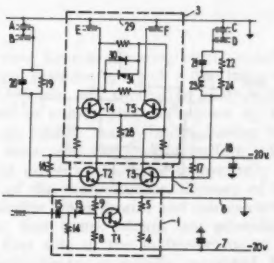
A rapid transit propulsion and braking control system utilizing a novel master controller including a differential transducer and novel circuitry arrangement for supplying an analog voltage to energize a P-wire circuit to maintain a desired vehicle speed either under a manual mode of operation or an automatic speed control mode of operation, wherein the novel circuitry provides rate control adjustments and speed taper control means for controlling the signal in the P-wire.

3,582,972
HIGH-SPEED PULSE COUNTER
Jean Terrier, Orsay, France, assignor to Compagnie Generale D'Electricite, Paris, France
Filed July 15, 1968, Ser. No. 744,979
Claims priority, application France, July 13, 1967, Mar. 28, 1968, 114396;145,976
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 **10 Claims**



High speed tunnel-diode counter constructed in successive stages and connected to assure a change of pulse polarity at each stage, the necessary condition for best operation.

3,582,973
A HIGH-SPEED BISTABLE SWITCHING CIRCUITS
Richard Munro Dorward, Galashiels, Scotland, assignor to The General Electric and English Electric Companies, Limited, London, England
Filed Nov. 29, 1968, Ser. No. 780,049
Claims priority, application Great Britain, Nov. 29, 1967, 54,326
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 **2 Claims**

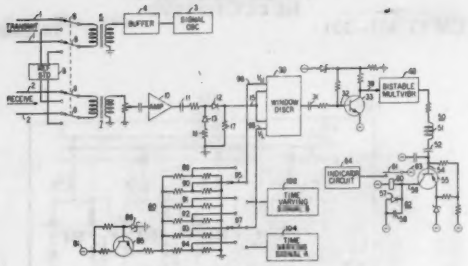


A two-state transistor circuit particularly for operation at high speeds in which switching pulses are repeatedly steered to one or other of two switching transistors. Repeated 'switching' to the same state, as in a 111111 pulse sequence, tends to build up a charge which delays a change of state when it eventually occurs (1111110). Two diodes connected back to back between the switching pulse electrodes of the transistors limit the charge accumulation and hasten the eventual state change. A resistor connected between the electrodes is an inferior alternative.

3,582,974
CIRCUIT TO ANALYZE A SIGNAL AMPLITUDE RANGE THROUGH FREQUENCY DISCRIMINATION TECHNIQUES
David L. Favin, Little Silver, and Peter F. Lynn, Red Bank, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Oct. 30, 1968, Ser. No. 771,724
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **7 Claims**

A signal amplitude analyzer quantizes discrete peak amplitude ranges of periodic signals into discrete frequencies by

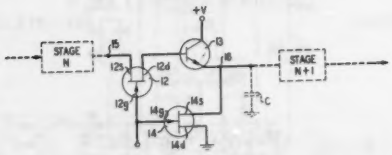
responding to the entry into and exit from these discrete ranges by the periodic signals. Indicating apparatus responsive to these discrete frequencies conveys information concerning the peak amplitude range of the periodic signals.



3,582,975
GATEABLE COUPLING CIRCUIT

Ernam F. King, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 17, 1969, Ser. No. 817,091
Int. Cl. H03k *17/00*
U.S. Cl. 307—251 **10 Claims**



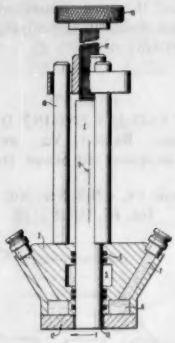
Circuit module for gateably coupling digital signals between two or more circuit nodes provides increased speed. A first field effect transistor and a bipolar transistor in a modified Darlington connection provide current gain in the direction of signal transfer for facilitating the transfer of a positive signal. A shunt field effect transistor, having its gate electrode electrically common with the gate electrode of the first field effect transistor, is connected between the transfer path and ground to facilitate transfer of a negative signal.

3,582,976
ELECTRODE FOR MAGNETOHYDRODYNAMIC GENERATOR

Jean-Claude de Simone, Paris, and Michel Maucolot, Nozay, both of, France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Oct. 30, 1969, Ser. No. 872,634
Claims priority, application France, Oct. 30, 1968, 172043
Int. Cl. H02n *4/02*
U.S. Cl. 310—11 **6 Claims**

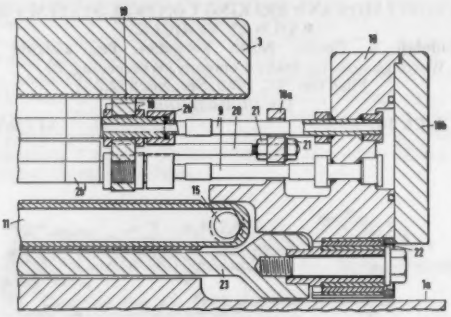
Electrode for an MHD generator, consisting of a metal element borne by a support in which it can move in the direction of its axis; the support and metal element surfaces exposed to hot gases flowing in the nozzle duct are electrically insulated by means of an insulating layer of cooling liquid vapor covering the surface of the lower part of the support.



3,582,977
DYNAMOELECTRIC MACHINES

David Alfred Smith, Newcastle-upon-Tyne, England, assignor to C. A. Parsons & Company, Limited, Newcastle-upon-Tyne, England

Filed Mar. 11, 1970, Ser. No. 018,633
Claims priority, application Great Britain, Mar. 13, 1969, 13371
Int. Cl. H02k *9/00*
U.S. Cl. 310—54 **7 Claims**



A dynamoelectric machine having a rotor body supporting a liquid cooled rotor winding, conductors of which protrude beyond the rotor body to form end winding portions, a rotor shaft, a passage in the rotor shaft for conveying liquid coolant to the rotor winding, a duct for carrying liquid coolant outside the shaft connected to the said passage, the said duct being located in the rotor body or immediately adjacent thereto, a further duct connected to or forming a continuation of the first mentioned duct, a manifold adapted to receive liquid coolant from the further duct and mounted so that it moves with an end winding portion of the rotor winding or the rotor body and is substantially independent of shaft movement and means connecting the manifold to the rotor winding for the flow of liquid coolant.

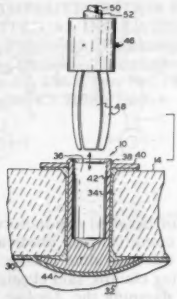
ERRATUM

For Class 310—156 see:
Patent No. 3,581,394

3,582,978
RIVET-SHAPED ELECTRICAL LEAD-THROUGH CONTACT

Ronald O. Petersen, Beaverton, and Jerry E. Turnbaugh, Portland, both of, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 28, 1969, Ser. No. 853,642
Int. Cl. H01j *5/46, 19/66, 29/00;* H01r *33/20*
U.S. Cl. 313—64 8 Claims

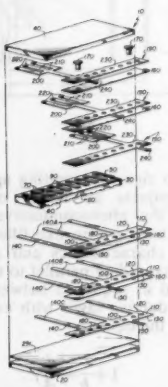


An electrical lead-through contact for a cathode-ray tube is described which is in the shape of a hollow metal rivet having an enlarged head portion closing one end thereof and an open end portion which is bent outward over a washer to mechanically fasten the rivet within an aperture in a ceramic envelope. A hermetic seal is then formed by heat fusion of glass previously provided around such rivet either as a glaze coating or as a compressed glass frit washer. The contact may be provided with a conductive coating over an oxide surface on such head portion to electrically connect it to a wallband electrode formed by another portion of such coating on the inner surface of the envelope. In another embodiment, a projection extends from such head portion for attachment to a lead conductor connected to another electrode within the tube envelope.

3,582,979
GASEOUS DISCHARGE DISPLAY DEVICE WITH INTERCONNECTING STRUCTURE FOR THE ELECTRODES

George A. Kupsky, Milford, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 7, 1969, Ser. No. 840,608
Int. Cl. H01j *17/04*
U.S. Cl. 313—210 8 Claims

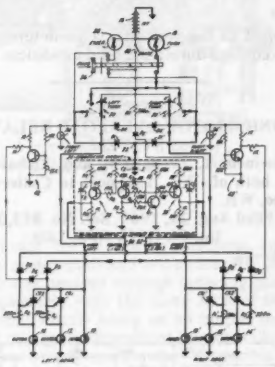


A cold cathode gaseous display device including a plurality of cathode plates having spaced-apart cathode tabs, each adapted to exhibit cathode glow. The cathode plates are identical and are positioned so that each tab of one is physically associated with the corresponding tabs of the others. Corresponding cathode tabs of each plate are thus physically arranged in a group. The device also includes an anode electrode for each group of cathode tabs, with each anode electrode including a separate anode tab for each cathode tab in the associated group.

3,582,980
ELECTRONIC LAMP SEQUENCING CIRCUIT

Peter Michael Marks, Warminster, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed June 6, 1969, Ser. No. 831,171
Int. Cl. H05b *37/00*
U.S. Cl. 315—210 7 Claims



An electronic lamp-sequencing circuit, useful in automobile turn signal systems, in which a first lamp is energized by closure of a switch, and thereafter second and third lamps are energized in overlapping succession by a delay circuit comprising an astable multivibrator having two alternately conducting sides, and two output buffers with capacitively shunted input circuits which are respectively driven by different sides of the multivibrator. Closure of the switch activates the astable multivibrator and causes current to be supplied to the first lamp. Means are provided to cause a preselected first side of the multivibrator to conduct first, when the multivibrator is initially energized. Means responsive to such conduction prevent the capacitor of one of the two output buffers from charging, whereby no output is supplied from said buffer and the lamp associated with it does not light. By the time conduction of the multivibrator switches to the second side thereof, the capacitor of the other output buffer has charged, allowing this buffer to supply, in response to conduction of the second side, an output which turns on the second lamp. Thereafter, by the time conduction of the multivibrator again switches to the first side, the capacitor of said one buffer also has charged, allowing this buffer to turn on the third lamp.

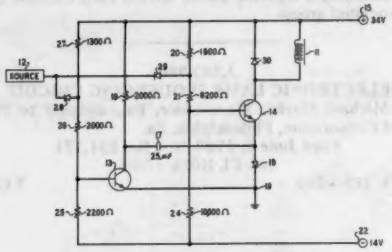
3,582,981
SOLENOID DRIVER CIRCUIT

Stephen A. Dalyai, Old Bridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 18, 1969, Ser. No. 808,178
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 5 Claims

A circuit for operating and holding a solenoid in response to an applied signal includes two transistor switches. The first switch closes a path between a capacitor and the solenoid coil to attain a voltage level necessary to operate the sole-

noid. The second switch closes a path between the capacitor and ground discharging the capacitor thereby decreasing the



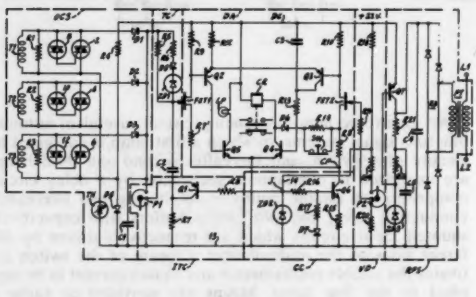
voltage applied to the coil after a predetermined time to a lower level required during the hold condition.

3,582,982

ELECTRONIC MOTOR OVERLOAD RELAY CONTROL SYSTEM

Merle R. Swinehart, Brookfield, and Richard A. Greiner, Madison, both of, Wis., assignors to Cutler-Hammer Inc., Milwaukee, Wis.

Filed Aug. 26, 1969, Ser. No. 853,089
Int. Cl. H02h *5/00, 3/08*
U.S. Cl. 317—22 **17 Claims**



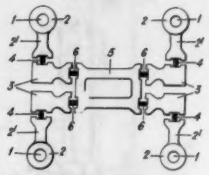
A solid-state differential amplifier system that trips out a relay when an overload condition occurs in a motor power supply circuit. An overload current sensing circuit provides a voltage proportional to the peak value of one or more overload conditions and includes a current avalanche device for protecting the following devices from excessive voltages. This voltage operates a timing circuit to provide a control voltage having an inverse time delay relative to the magnitude of the overload condition sensed. The control voltage upon reaching an ultimate trip value that is adjustable trips a differential amplifier to deenergize the overload relay. A diode-resistor circuit makes the tripping action regenerative once it is started for positive dropout of the overload relay. A constant current circuit supplies operating current to the differential amplifier. A voltage divider provides a voltage that normally biases the differential amplifier on to energize the overload relay and includes a potentiometer for adjusting the ultimate trip current value. The voltage divider supplies an operating voltage for the constant current circuit. An optional instantaneous trip circuit receives a reference voltage from the voltage divider circuit and functions to cause immediate tripping of the differential amplifier when the overload current exceeds a predetermined point above the ultimate trip value. The system provides time delayed automatic or manual reset as alternatives with minor modification.

3,582,983

ELASTIC SPACER FOR BUNDLES OF CONDUCTORS

Rodolfo Claren, Milan, Italy, assignor to A. Salvi & C. S.p.A., Milan, Italy

Filed Jan. 9, 1970, Ser. No. 1,724
Claims priority, application Italy, Feb. 22, 1969, 13217A/69
Int. Cl. H02g *7/12, 7/14*
U.S. Cl. 174—42 **5 Claims**



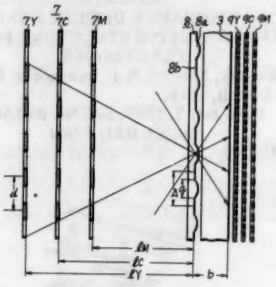
Elastic spacer for bundled conductors in overhead electric lines, of the type comprising an elastically deformable structure anchored to the individual conductors of the bundle by means of connecting clamps, said elastic spacer also performing a function of damping the Aeolian vibrations. Said connecting clamps of the elastic spacer extend in the form of rigid projections, the free ends of which are mutually associated through at least one intermediate rigid body to which they are anchored by means of springing hinge elements, each constituted by at least one short length of straight wire rope fixed securely to the two rigid parts to be connected.

3,582,984

COLOR VIDEO SIGNAL GENERATING APPARATUS

Hiromichi Kurokawa, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 3, 1969, Ser. No. 795,881
Claims priority, application Japan, Feb. 5, 1968, 43/7044
Int. Cl. H04n *9/06*
U.S. Cl. 178—5.4 **8 Claims**



In a color video signal generating apparatus in which an objective lens projects an image of an object to be reproduced onto the photoconductive layer of a vidicon tube, color filters having stripelike filter regions of different wavelength band characteristics and a lens screen having cylindrical lenses extending parallel to the stripelike filter regions are arranged in sequence between the objective lens and the photoconductive layer with each color filter being disposed to satisfy the equation

$$1+\frac{l}{b}=\frac{d}{A}\gamma'$$

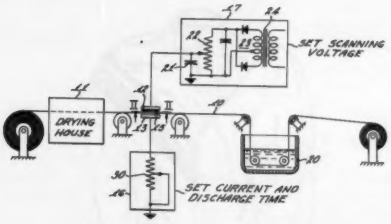
in which l is the distance from the respective color filter to the lens screen, b is the distance from the lens screen to the photoconductive layer, d and A are respectively the pitches of the filter regions of the respective color filter and of the

lenses of the lens screen, and γ' is a positive integer, and further the distances of the color filters from the lens screen and the pitches of the respective filter regions on the color filters are selected so that the images of the filter regions of each color filter projected by the cylindrical lenses on the photoconductive layer have pitches different from those of the images of the filter regions of the other color filters.

3,582,985
METHOD OF IMPROVING STRIP PAPER FOR ELECTRICAL INSULATION

William C. Farneth, Pittsburgh, Pa., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Feb. 12, 1969, Ser. No. 798,718
Int. Cl. H05b 7/18
U.S. Cl. 219—384 **6 Claims**

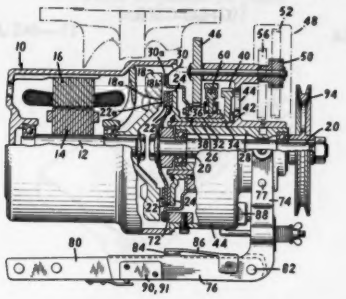


The dielectric reliability of sheet electrical insulating is improved by removing conductive impurities of a selected size smaller than the thickness of the sheet and forming minute clean perforations in the sheet where the particles were removed. The sheet is scanned between opposing electrodes having a preselected potential applied therebetween to detect conductive particles of a desired size smaller than the sheet thickness, and sufficient current is discharged between the electrodes and through each particle for sufficient interval of time to remove the conductive particle and form a clean perforation without charring or tracking of the insulation.

3,582,986
CLUTCH MOTOR

Masahiro Yokoyama, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1969, Ser. No. 823,300
Claims priority, application Japan, May 13, 1968, 43/32360
Int. Cl. H02k 7/10
U.S. Cl. 310—76 **4 Claims**



A clutch motor for a sewing machine comprising a flywheel on the motor shaft and two concentric clutch wheels connected with one another through reducing gearing and alternatively engageable with the same face of the flywheel. One of the clutch wheels being on an output shaft which is thereby driven at a speed dependent on which clutch wheel is engaged. A lever arrangement makes it possible to stop the sewing machine selectively in different positions as desired.

3,582,987

METHOD FOR PRODUCING POLYMERS AND COPOLYMERS OF CERTAIN UNSATURATED HYDROCARBONS

Giulio Natta, Piero Pina, and Giorgio Mazzanti, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed June 8, 1955, Ser. No. 514,098
Claims priority, application Italy, July 27, 1954, 25,109/54
Int. Cl. C08f *1/42, 3/10*
U.S. Cl. 260—93.5 15 Claims

There is disclosed a process for polymerizing unsaturated hydrocarbons of the formula

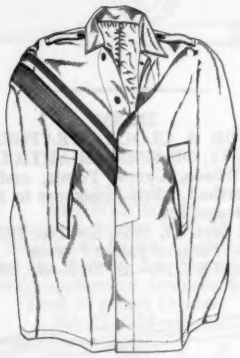
$$CH_2{=}CHR$$

in which R is a saturated aliphatic, an alicyclic or an aromatic radical, alone, in mixtures with one another, or in mixtures with small amounts of another monomer copolymerizable therewith. In the formula given R may be, in specific modifications, an alkyl, cycloalkyl or aryl radical. The process involves polymerizing the unsaturated hydrocarbons, alone or in the mixtures, in contact with a catalyst prepared from a halide of a transition metal belonging to Groups IV to VI inclusive of the Mendeleeff Periodic Table and an alkyl compound of a metal belonging to Groups II to III of said Table, in the presence of the monomer.

DESIGNS

GRANTED JUNE 1, 1971

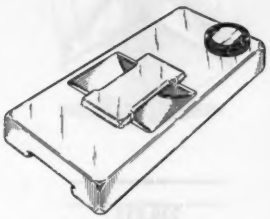
220,828
RAIN CAPE
Sid Lawson, New City, N.Y., assignor to Sun Oil Company, Philadelphia, Pa.
Original design application Sept. 17, 1968, Ser. No. 13,566. Divided and this application Mar. 19, 1970, Ser. No. 21,975
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—179



220,829
BRACKET FOR AN OVERHEAD DOOR ASSEMBLY
John C. Williams, Columbus, Ohio, assignor to Kinnear Corporation, Columbus, Ohio
Filed Sept. 11, 1969, Ser. No. 19,119
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—233

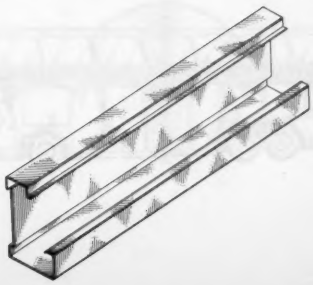
220,830
PEG MOUNTABLE CLIP FOR HANGING ARTICLES THEREFROM
Burton Harrison, 43 Pinecroft Road, Weston, Mass. 02193
Filed Oct. 17, 1969, Ser. No. 19,597
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—259

220,831
BOTTLE FOR DEVELOPER
Robert C. Zimmerman, Manlius, N.Y., and Carl L. Turner, Mount Prospect, Ill., assignors to SCM Corporation, New York, N.Y.
Filed Feb. 13, 1970, Ser. No. 21,432
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71

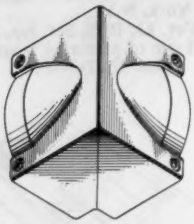


220,832
DETACHABLE TOP MEMBER FOR A CONTAINER
Paul Andrew Lapidus, Monterey, Calif., assignor to American Can Company, New York, N.Y.
Filed Oct. 2, 1969, Ser. No. 19,390
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253

220,833
PATIO FASCIA PANEL
Arthur E. Haskell, Downey, William N. Brummet, Burbank, and Robert Fitzgerald, Huntington Beach, Calif., assignors to State Industries, Huntington Park, Calif.
Filed Mar. 13, 1970, Ser. No. 21,901
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

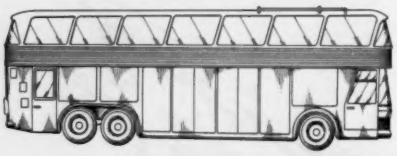


220,834
PATIO COVER CORNER ADORNMENT
Arthur E. Haskell, Downey, William N. Brummet, Burbank, and Robert Fitzgerald, Huntington Beach, Calif., assignors to State Industries, Huntington Park, Calif.
Filed Mar. 13, 1970, Ser. No. 21,902
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

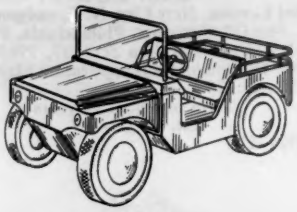


220,835
MOTOR SCOOTER
Allan Thieme, 6712 Dixie Highway, Bridgeport, Mich. 48722
Filed July 28, 1969, Ser. No. 18,439
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3

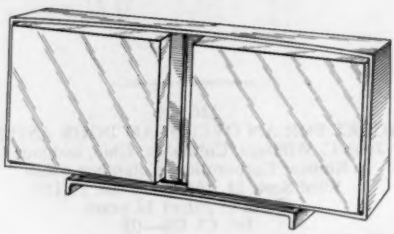
220,836
PHOTOGRAPHIC PASSENGER BUS
Fouad Said, Los Angeles, Calif., assignor to Fouad Said Production Inc., Los Angeles, Calif.
Filed Dec. 18, 1969, Ser. No. 20,551
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3

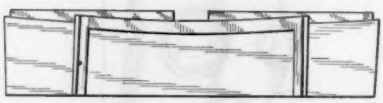


220,837
VEHICLE
Irving Carl Mattson, Bay City, Mich., assignor to Aerospace America, Inc., Bay City, Mich.
Filed Jan. 23, 1970, Ser. No. 21,057
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



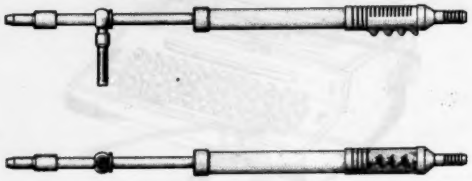
220,838
HOUSING FOR A CLOCK, WEATHER INSTRUMENT, OR SIMILAR ARTICLE
Lawrence H. Wilson, Grosse Pointe, and Alphonse J. Kosinski, Marshall, Mich., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Sept. 30, 1969, Ser. No. 19,355
Term of patent 7 years
Int. Cl. D14—*03;* D10—*01, 09*
U.S. Cl. D52—7



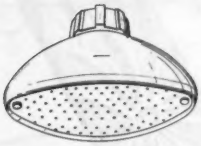


220,839
FISH LURE
Joseph J. Sabol, West Hazleton, Pa., assignor of fractional part interest to Joseph J. Ustynoski, West Hazleton, Pa.
Filed Jan. 28, 1970, Ser. No. 21,122
Term of patent 14 years
Int. Cl. D22—*07*
U.S. Cl. D22—27

220,840
MANUALLY OPERABLE PUMP
Robert F. Rolsten, Dayton, Ohio (1436 Adirondack Trail, Kettering, Ohio 45409), and Harold H. Hunt, 5965 Manon St., La Mesa, Calif. 92041
Filed Dec. 18, 1969, Ser. No. 20,550
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—14



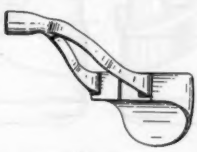
220,841
SHOWER HEAD
William Mortimer Kelly, 61 Vista St., Sans Souci, New South Wales, Australia
Filed Oct. 8, 1969, Ser. No. 19,470
Claims priority, application Australia Apr. 29, 1969
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



220,842
CASING FOR TAPE READER
Arlon G. Sangster, Sterling, Mass., assignor to Jamesbury Corp., Worcester, Mass.
Filed Sept. 8, 1969, Ser. No. 19,048
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

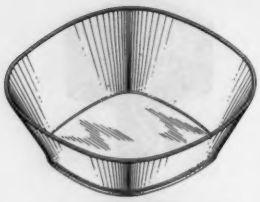
220,843
CAT HOUSE
Weldon R. Cook, 30700 Manzano Drive, Malibu, Calif. 90265
Filed Feb. 9, 1970, Ser. No. 21,329
Term of patent 7 years
Int. Cl. D30—*01*
U.S. Cl. D30—1

220,844
GOLF CLUB
Hope L. Letters, East Lothian, Scotland, assignor to Ben Sayers Limited, East Lothian, Scotland
Filed Feb. 16, 1970, Ser. No. 21,454
Claims priority, application Great Britain Aug. 29, 1969
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

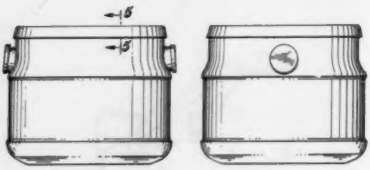


220,845
CUP
Joseph Anthony Mascetti, Jr., Geneva, Ill., assignor to American Can Company, New York, N.Y.
Filed Oct. 23, 1969, Ser. No. 19,683
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—9

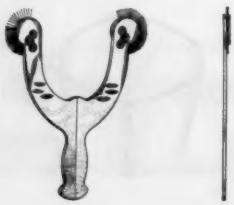
220,846
BOWL
Joseph Anthony Mascetti, Jr., Geneva, Ill., assignor to American Can Company, New York, N.Y.
Filed Oct. 23, 1969, Ser. No. 19,682
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15



220,847
PLASTIC CONTAINER FOR LIQUIDS
William J. Holcroft and Richard C. Rheinhart, North Aurora, and Jerald E. Briggs, West Chicago, Ill., assignors to American Can Company, New York, N.Y.
Filed Jan. 9, 1970, Ser. No. 20,849
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D49—29



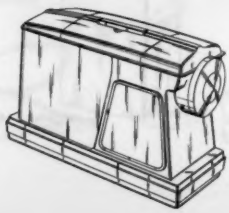
220,848
COMPLEXION COLOR MEASURING DEVICE
Robert C. Dorr, Woodland Hills, Calif., assignor to Ameritone Color Key Corporation, Compton, Calif.
Filed June 9, 1969, Ser. No. 17,606
Term of patent 14 years
Int. Cl. D10—*99*; D28—*02*
U.S. Cl. D52—6



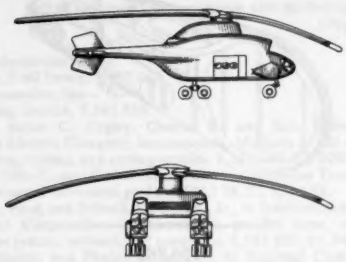
220,849
ELECTRIC PORTABLE TYPEWRITER
Thomas McGourty, Aptos, Calif., assignor to Commodore Business Machines (Canada) Limited, Toronto, Ontario, Canada
Filed Dec. 10, 1969, Ser. No. 20,440
Claims priority, application Japan Sept. 30, 1969
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

220,850
PAINT ROLLER
J. C. Davis, 9818 Hathaway, Dallas, Tex. 75220
Filed Apr. 8, 1970, Ser. No. 22,329
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—18

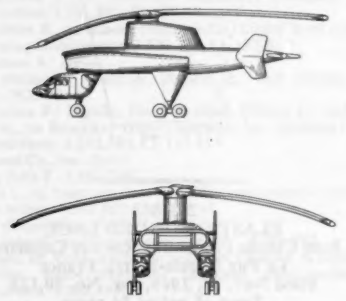
220,851
PORTABLE SEWING MACHINE
Richard H. Arbib, New York, N.Y., assignor to White Sewing Machine Company, Cleveland, Ohio
Filed May 13, 1970, Ser. No. 22,964
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D70—1



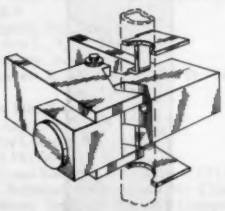
220,852
HELICOPTER
Roger L. Gamaunt, Manhattan Beach, Calif., assignor to Hughes Tool Company, Aircraft Division, Culver City, Calif.
Filed Feb. 6, 1970, Ser. No. 21,309
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1



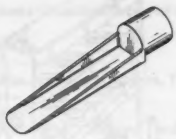
220,853
HELICOPTER
Roger L. Gamaunt, Manhattan Beach, Calif., assignor to Hughes Tool Company, Aircraft Division, Culver City, Calif.
Filed Feb. 6, 1970, Ser. No. 21,308
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1



220,854
FLUID FLOW SENSOR
Anthony D. Lambo and Rodney W. Reder, Waterbury, Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Apr. 24, 1970, Ser. No. 22,621
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



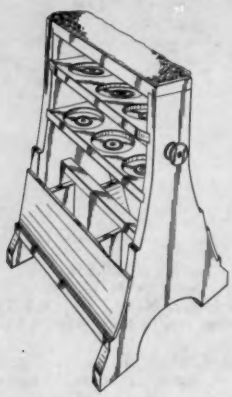
220,855
TONGUE DEPRESSOR
Montague Richard Duval, St. Petersburg, Fla., assignor to Concept, Inc., St. Petersburg, Fla.
Filed Feb. 5, 1970, Ser. No. 21,279
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—12



220,856
ASH TRAY
Harry W. Hollister, New York, N.Y., assignor of fractional part interest to Betty Mabel Coester, New York, N.Y.
Filed June 8, 1970, Ser. No. 23,370
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2

220,857
ASH TRAY
Harry W. Hollister, 89 Thayer St. 10040, and Betty Mabel Coester, 60 Seaman Ave. 10034, both of New York, N.Y.
Filed June 15, 1970, Ser. No. 23,491
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2

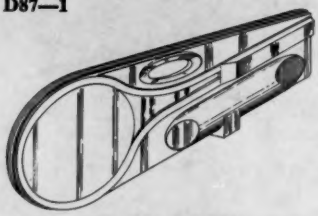
220,858
SHOE GROOMING STAND
Albert T. Poole, Lakeside, Calif., assignor to White Fields Inc., West Columbia, S.C.
Filed June 25, 1969, Ser. No. 17,867
Term of patent 14 years
Int. Cl. D28—*99*
U.S. Cl. D86—12



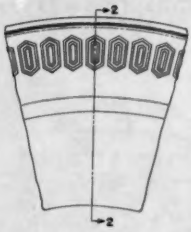
220,859
SHEATH FOR UMBRELLA
Richard Zimmermann, Leichlingen, Rhineland, Germany, assignor to W. Bauermann & Soehne GmbH, Hilden, Rhineland, Germany
Filed Sept. 3, 1969, Ser. No. 18,987
Claims priority, application Germany Mar. 17, 1969
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D87—1

220,860
MUSICAL TOTE BOX OR THE LIKE
Ernest L. Thornell, Horicon, Wis., assignor to Marlin Toy Products, Inc., Horicon, Wis.
Filed Mar. 2, 1970, Ser. No. 21,680
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1

220,861
RACKET CARRYING CASE
Paul A. Brefka, Framingham, Peter A. Latham, Newburyport, and Thomas R. Salvo, Malden, Mass. (all % 39 Commercial Wharf, Boston, Mass. 02110)
Filed Mar. 9, 1970, Ser. No. 21,791
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



220,862
TIRE
Harold D. Fetty, Birmingham, Mich., and Frederick F. Vannan, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Original design application Mar. 10, 1969, Ser. No. 16,135, now Patent No. 219,090. Divided and this application Jan. 6, 1970, Ser. No. 20,778
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20



220,863
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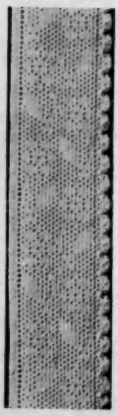
Jean Claude Fontanille, Rue des Capucins, Le Puy (Haute-Loire), France
Filed Nov. 17, 1969, Ser. No. 20,113
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D92—1



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF JUNE, 1971

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Lee, Arthur; and Stainsby, John C., to Skil Corporation (Canada) Ltd. Thread-on connecting rod and crank assemblies. 3,581,599, Cl. 74-603.

Leeds & Northrup Company: *See—*
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Verspieren, Jean-Pierre, 3,581,349.

Lehmann, Klaus; Siegel, Emil; and Kreuzer, Manfred, to Fernseh GmbH. Low-noise video amplifier. 3,582,800, Cl. 330-18.

Lejon, Jean C.; and Herjean, Michel L., to Controle Bailey (Societe Anonyme). Buffer circuit for decoupling system interference. 3,582,753, Cl. 321-2.

Le Maout, Alain Yves; and Lerouge, Claude P., to International Standard Electric Corporation. Non-linear decoder. 3,582,941, Cl. 340-347.

Le May, Christopher Archibald Gordon, to Electric & Musical Industries Limited. Pattern recognition devices. 3,582,898, Cl. 340-172.5

Lemelson, Jerome H. Audio-visual record member and playback means therefore. 3,582,201, Cl. 353-16.

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Lenz, Hans; Mehlbeer, Jochen; and Macura, Heinrich, to Eisen und Metall A.G. Method of recovering metals from cables and the like. 3,582,004, Cl. 241-19.

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Lottiau, Andre F. A., to National Cash Register Company, The. Business machine printer ribbon automatic inking device. 3,581,863, Cl. 197-171.

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Louks, Robert A. Apparatus for distributing grain to a combine chaffer screen. 3,581,746, Cl. 130-24.

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Manau de Chueca, Maria Dolores. Pocket microscope including illuminating means and movable objective. 3,582,181, Cl. 350-87.

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Marker, Hannes. Toe iron for safety ski bindings. 3,582,099, Cl. 280-11.35
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Marz, Helmut, to Erhard Lauster Entwicklungen Gesellschaft mit beschrankter Haftung. Dredger vessel. 3,581,924, Cl. 214-767.
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McBride, Clarence E., to Eastman Kodak Company. Light developable direct print silver halide compositions containing phosphonium salts. 3,582,345, Cl. 96-107.
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McComb, Frank E. Belt splice and splicer. 3,581,350, Cl. 24-33.
McCoy, Clifton L. Nut shelling device. 3,581,788, Cl. 146-13.
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Nobelius, Nils Gustav Axel; and Albertsson, Kurt Soren, to Sven Arvid Alexandersson. Movable grates for furnaces, particularly refuse incinerators. 3,581,684, Cl. 110-39.
Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light contrast meter for measuring the difference between maximum light intensity and immediately incident light intensity or other intensity. 3,582,220, Cl. 356-226.
Noetinger, Philippe, to Compagnie Generale D'Automatisme. Method and apparatus for measuring the concentration of automotive traffic. 3,582,620, Cl. 235-150.24
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Nomura, Katsuhiko; and Sakazaki, Tadazumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Through-the-lens light measuring system. 3,581,642, Cl. 95-42.
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Noren, Tore H.; and Federighi, George J. Drinking glass or dish washer with three sided door movable downwardly into tank to open washing and rinsing compartment. 3,582,173, Cl. 312-319.
Norgren, Carl T.; Roudebush, William H.; and Humenik, Francis M., to United States of America, National Aeronautics and Space Administration. Gas turbine combustor. 3,581,492, Cl. 60-39.36
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Okuda, Nobuo, to Tokyo Shibaura Electric Co., Ltd. Interpolator for numerical control systems. 3,582,622, Cl. 235-151.11

Okuhashi, Tomomi, to Teijin Limited. Carpet having durable antistatic properties. 3,582,445, Cl. 161-66.

Okuhashi, Tomomi; and Kumura, Kinichi, to Teijin Limited. Garments having durable antistatic properties. 3,582,448, Cl. 161-87.

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Paleologo, Teo; Passalenti, Bettino; Fiorani, Osvaldo; and Nistri, Ugo, to Societa 'Italiana Resine S.p.A. Foundry composition comprising granulated base material, polyisocyanate and alkyd resin modified with oil and polyamide resin. 3,582,506, Cl. 260-22.

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Brault, Albert T. Method of making stabilized silver halide emulsions sensitive to light. T887,004, 6–1–71, Cl. 96—27.

Burness, Donald M., and R. A. Silverman. Ketovinyl compounds and photographic hardeners. T887,006, 6–1–71, Cl. 96—111.

Bushnell, Clifford B. Roll deboxing and transporting apparatus. T887,003, 6–1–71, Cl. 214—622.

Caldwell, John R.: *See*—
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Chaddock, Richard E. Dissipation of atmospheric fog. T887,-013, 6–1–71, Cl. 239—2.

Dallon, Dale S., K. R. Rush, I. F. Salminen, and P. S. Von Bacho. 5-pyrazolone enol esters coupler precursors in fore-hardened incorporated-coupler color photographic materials and methd to convert same to free 5-pyrazolone. T887,007, 6–1–71, Cl. 96—100.

Davis, Thomas G.: *See*—
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Hutton, Philip F.: *See*—
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Jackson, Winston J., Jr., and J. R. Caldwell. Composite assemblies incorporating three-dimensional polymers. T887,-001, 6–1–71, Cl. 161—183.

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Kibler, Charles J., D. L. Nealy, and T. G. Davis. Control of molecular weight of poly(ethylene terephthalate) during solid phase polycondensation. T887,005, 6–1–71, Cl. 260—75.

McGraw, Carl W., and P. F. Hutton. Photographic elements having non-gelatin overcoats. T887,012, 6–1–71, Cl. 96—67.

Milton, Kirby M. Photographic materials. T887,016, 6–1–71, Cl. 96—107.

Nealy, David L.: *See*—
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Overbay, Howard L., and P. J. Trent. Hot melt adhesive tapes for filling seams between adjacent dry-wall construction boards and for other purposes. T887,014, 6–1–71, Cl. 161—118.

Phillips, Howard E. Ammonia-bromotrifluoromethane fire extinguishing composition. T887,011, 6–1–71, Cl. 252—8.1.

Rush, Kent R.: *See*—
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Werts, Arthur P., III. Inhibiting polymerization of vinyl monomers. T887,010, 6–1–71, Cl. 252—404.

Wolinski, Leon E., to E. I. du Pont de Nemours and Company. Removal of antioxidant from styrene-butadiene copolymer film with reducing flame. T887,002, 6–1–71, Cl. 264—80.

Yackel, Edward C. Method of making a silver halide sensitized direct-positive lithographic printing plate. T887,008, 6–1–71, Cl. 96—33.

Yackel, Edward C. Development of photographic materials. T887,015, 6–1–71, Cl. 96—50.

LIST OF REISSUE PATENTEES

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Dinsmore, Dawson J., and Barron. Re. 27,135.

Dinsmore, Dawson J., deceased, by T. J. Barron, executor, to D. J. Dinsmore Co. Readily removable double hung window. Re. 27,135, 6–1–71, Cl. 49—446.

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Elliot Laboratories, Inc.: *See*—
Ilg, John C. Re. 27,132.

Franke, Harry, to Spot Heaters, Inc. Space heater base plate construction. Re. 27,131, 6–1–71, Cl. 126—59.5.

General Electric Company: *See*—
Morgan, Raymond E., Morgan, and Bedford. Re. 27,128.

Ilg, John C., to Elliot Laboratories, Inc. Apparatus for treating blood. Re. 27,132, 6–1–71, Cl. 23—258.5.

Ivester, Joe A. Pipe working assembly. Re. 27,127, 6–1–71, Cl. 10—106.

Lemelson, Jerome H. Adjustable manipulator. Re. 27,129, 6–1–71, Cl. 214—1.

Middleton, William J., to E. I. du Pont de Nemours and Co. Certain 4-amino-3-oxazolines having halogenated hydrocarbon substitutents in the 2- and 5-positions. Re. 27,133, 6–1–71, Cl. 260—307.

Morgan, Agnes T.: *See*—
Morgan, Raymond E., and Bedford. Re. 27,128.

Morgan, Raymond E., deceased, by A. T. Morgan, administratrix, and B. D. Bedford, to General Electric Co. Solid state power circuits employing new autoimpulse commutation. Re. 27,128, 6–1–71, Cl. 321—43.

Murata, Sanijro. Ultraminiature tape recorder with two-way gravity-operated control switch actuated by change in vertical orientation of recorder. Re. 27,130, 6–1–71, Cl. 179—100.2.

Pratt, John N., to R.C.A. Corp. Keyed burst separator. Re. 27,134, 6–1–71, Cl. 178—5.4.

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Holcroft, William J., Rheinhart, and Briggs. 220,847.

Brummet, William N.: *See*—
Haskell, Arthur E., Brummet, and Fitzgerald. 220,833.
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Wilson, Lawrence H., and A. J. Kosinski, to Sunbeam Corp. Housing for a clock weather instrument or similar article. 220,838, 6–1–71, Cl. D52—7.

Zimmerman, Robert C., and C. L. Turner, to SCM Corp. Bottle for developer. 220,831, 6–1–71, Cl. D9—71.

Zimmermann, Richard, to W. Bauermann & Soehne GmbH. Sheath for umbrella. 220,859, 6–1–71, Cl. D87—1.

CLASSIFICATION OF PATENTS

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32 : 3,582,167

33 : Re.27,132
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36 : Re.27,128
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42 : 3,582,666
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43 : 3,581,394
44 : 3,582,037
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45 : RE.27,127
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3,582,421
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46 : RE.27,135
47 : 3,581,348
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48 : 3,581,322
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48 : 3,581,685
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51 : 3,581,323
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51 : 3,582,010
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53 : RE.27,131
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54 : 3,582,250
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57 : 3,581,989

Design Patents

6 : 220,832
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220,843
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6 : 220,852
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36 : 220,828
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220,851
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39 : 220,829
220,840
42 : 220,839
48 : 220,850
55 : 220,860

DEFENSIVE PUBLICATIONS APPLICATIONS

(Notice of Dec. 16, 1969, 869 O.G. 687)

10 : T887,011
36 : T887,002
T887,003

36 : T887,004
T887,006
T887,007

36 : T887,008
T887,009
T887,012

36 : T887,013
T887,015
T887,016

47 : T887,001
T887,005

48 : T887,010
T887,014

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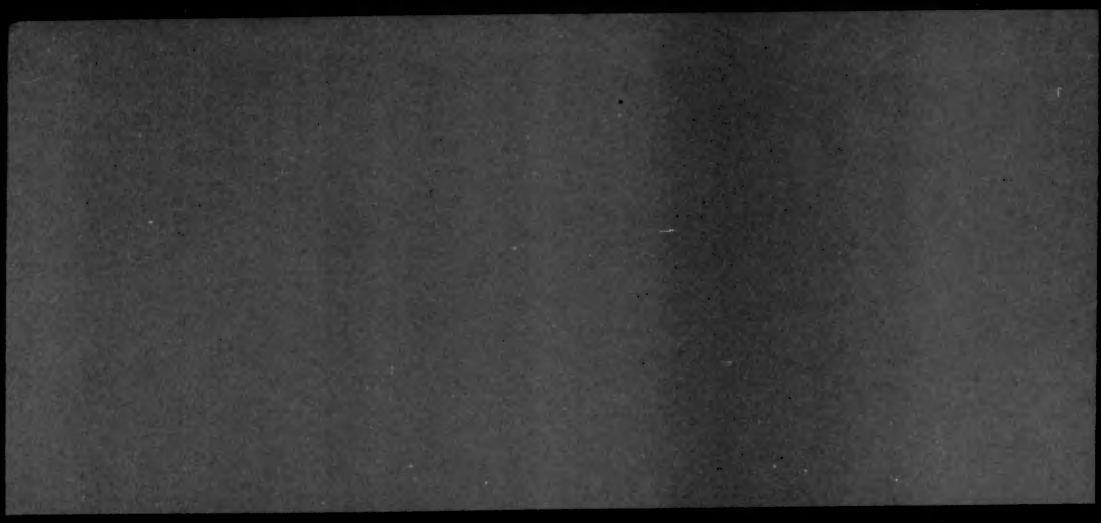

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